PacsOne Server User's Manual

For

PacsOne Server Premium Edition

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Revision: 6.4.2

GLOSSARY

AE	Application Entity
AET	Application Entity Title
PACS	Picture Archive and Communication System
DICOM	Digital Imaging and Communications in Medicine
DMWL	Dicom Modality Worklist
FSC	File Set Creator
FSR	File Set Reader
HIPAA	Health Insurance Portability and Accountability Act
HL7	Health Level Seven
HTML	Hyper-Text Mark-up Language
HTTP	Hyper Text Transfer Protocol
LUT	Look Up Table
PHP	PHP: Hypertext Preprocessor
NEMA	National Electrical Manufacturers Association
NTLM	(NT LanMan) is an authentication process that's used by all members of the Windows NT family of products
SCP	Service Class Provider
SCU	Service Class User
SMTP	Simple Mail Transfer Protocol
SOP	Service-Object Pair
SR	Structured Report
UID	Unique ID
UNC	Universal Naming Convention

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1 Revision

Date	Revision	Author	Reason
1/3/2004	1.0	Xiaohui Li	Initial version
2/29/2004	1.1	Xiaohui Li	Add section about Referring/Reading Physician Name matching for private patients/studies
5/28/2004	1.2	Xiaohui Li	Add sections for new features including DICOM Structured Report, Modality Worklist Management
7/15/2004	1.3	Xiaohui Li	Add sections for new features including exporting patients/studies to and importing external patients/studies from DICOM Media Storage Formatted media, custom data element coercion rules
7/30/2004	1.4	Xiaohui Li	Add support for importing external raw image files without DICOMDIR directory record
9/18/2004	1.5	Xiaohui Li	Add section for Automatic Purging Archive Directories
10/8/2004	1.6	Xiaohui Li	Add section for Automatic Image Routing by Key Attributes
2/8/2005	1.7	Xiaohui Li	Add section for printing to Dicom printers
4/5/2005	1.8	Xiaohui Li	Add section for remote study synchronization
5/31/2005	1.9	Xiaohui Li	Add option to move aged studies to a destination folder when running automatic study purge
7/10/2005	1.10	Xiaohui Li	Add Routing By Schedule Window; Add option to compress exported content into ZIP files
8/18/2005	1.11	Xiaohui Li	Add Statistics Reports, System Journal Log, SMTP Server Configurations
11/6/2005	1.12	Xiaohui Li	Added Study/Image Notes, Upload privilege, Duplicate Patient ID Resolution page
1/14/2006	3.1.8	Xiaohui Li	Update document revision numbering scheme; Add System Configuration Page
5/11/2006	4.0.1	Xiaohui Li	Add HL7 Message Listener related pages; Add User Profile page; Updated Search, Tools and Image Thumbnails pages
7/10/2006	4.0.2	Xiaohui Li	Add Unread Studies link to the Main Menu; Add **Upload Directory** settings to the System Configuration page
11/20/2006	4.1.3	Xiaohui Li	Add Upload Dicom Image to the **Tools** page; Add Auto-Scan parameters and Thumbnail/Full-Size Images Directories to the Configuration page; Add Preferred Transfer Syntax to the AE Configuration page
1/29/2007	4.1.4	Xiaohui Li	Add Support for Group Users; Add Database Integrity Check to the **Tools** page
4/12/2007	5.1.1	Xiaohui Li	Added support for Mac OS X
7/15/2007	5.1.2	Xiaohui Li	Added section about Post-Receive Image Compression; Added Import Worklist to the **Tools** page
10/18/2007	5.1.3	Xiaohui Li	Added Institution Name (0008,0080) to the supported Data Element Coercion table; Added support for Automatic Purging By Study Date and Date When Study Is Received; Added Live

			Monitor and Patient Reconciliation pages to the **Tools** menu; Added support for Long-Term Archive Directory and Automatic Aging from Short-Term to Long-Term Archive Directories; Added Dicom Command Filtering for more granulated AE-level access control
01/28/2008	5.1.4	Xiaohui Li	Added more Automatic Routing keys: **Study Description (0008,1030)**, and **Series Description (0008,103E)**; Added Enter New Worklist page for manually entering Modality Worklist data; Added **Automatic Worklist Scan** option to the System Configuration menu
04/23/2008	6.1.1	Xiaohui Li	Added Immediate **[From, To]** Schedule option for Automatic Routing; Support multiple email addresses for registered users; Added a <**Email JPG Image**> button to the full-size image page to send converted JPG/GIF images via email
07/10/2008	6.1.2	Xiaohui Li	Added **Automatic Purging By Dicom Data Element Filter**; Added checkboxes for enabling/disabling the daily, weekly or monthly statistics report and the system journal report emails sent to the Administrator's email address; Added more Automatic Routing keys: **Modality (0008,0060)**, and **Modalities In Study (0008,0061)**
12/18/2008	6.1.3	Xiaohui Li	Added **Study Reconciliation** option to the Configuration page; Added detailed examples for **Data Element Coercion** rules; Added **Monitor** and **Mark Study** privileges configurable for individual users and groups; Changed the Post-Receive Image feature to be configurable for each source AE
06/28/2009	6.2.1	Xiaohui Li	Added **Compression Ratio** and **Image Quality** settings for JPEG lossy mode compression transfer syntaxes during Post-Receive Image Compression; Added command-level access control for Dicom Modality Worklist (DMWL) querying client applications; Added references to Oracle databases; Added **Tools->Anonymization Templates** page
12/28/2009	6.2.2	Xiaohui Li	Added **Storage Commitment Report SCP** option to the **Application Entity** page; Added Purge By Source AE Title option to **Tools->Automatic Purge Storage Directories** page; Added **Sending AE Title** as a configurable option when defining Automatic Routing rules; Added **Preferred Import Removable Media Drive**, Preferred **Import Destination Folder** and **Study/Image Notes Sharing** settings to the Profile page
03/10/2010	6.2.3	Xiaohui Li	Added **Automatic Routing** by both Source AE Title and Key Attribute by using the logical AND (&&) operator
9/23/2010	6.2.4	Xiaohui Li	Added **Web User Assignment** by Source AE Title when logged-in as the Administrator; Added

			notes about **Forwarding N Latest Studies to Destination AE** option for the Automatic Routing section; Added non-default character set settings in the **Configuration** page
4/26/2011	6.3.1	Xiaohui Li	Added **Transcription Template** (Microsoft Word) in the **Tools** menu for Windows platforms
9/26/2011	6.3.2	Xiaohui Li	Added optional **User Access Filters** based on data elements from received Dicom studies; Added support for **Preferred Dicom Transfer Syntax** for receiving images from a Source AE; Added **Advanced Logical Expressions** for Automatic Dicom Image Routing
1/28/2012	6.3.3	Xiaohui Li	Added support for configurable **Retry Interval** for Automatic Routing Rules; Added **System Administration** privilege to individual or group users for sharing the workload as well as the privilege of the System Administrator; Added configurable number of records displayed in multi-page web user interface pages that can be customized in each web user Profile
4/16/2012	6.3.4	Xiaohui Li	Added support for Web Access to DICOM Persistent Objects (**WADO**)
8/28/2012	6.3.5	Xiaohui Li	Added **Change Storage** privilege for moving selected Dicom studies to a user-specified storage location
1/8/2013	6.3.6	Xiaohui Li	Added configuration for embedding website URL in statistics report emails in the **Configuration** page
4/28/2013	6.3.7	Xiaohui Li	Added option for sending HL7 ORU message to defined HL7 applications with the URL link to access newly arrived Dicom studies upon receipt
9/28/2013	6.3.8	Xiaohui Li	Added **Restart Service** page in the **Tools** menu
1/28/2014	6.4.1	Xiaohui Li	Added Statistics Report by each Source AE defined in the **Dicom AE** page; Added **AE Group Settings** in the **Dicom AE** page
5/28/2014	6.4.2	Xiaohui Li	Added **Priority** setting for **Automatic Routing Rules**

Table 1 Revisions

2 Reference Documents

No.	Standards	Date	Description
1.	Digital Imaging and Communications in Medicine (DICOM) Version 3.0	2008	Part 1 through Part 16 of the 2008 DICOM 3.0 Standard
2.	PacsOne Server Installation Guide	2014	PacsOne Server Installation Guide
3.	Version 2.3.1 of the Health Level Seven (HL7) Standard	1999	Version 2.3.1 of HL7 specifications

Table 2 Reference Documents

3 Introduction

PacsOne Server is a DICOM 3.0 compliant Picture Archive and Communication System (PACS) application, which consists of the following components:

- A DICOM protocol server for servicing requests for image storage, query and retrieval, forwarding, routing, printing images, and Dicom-formatted media interchange through import and export functions.
- MySQL or Oracle databases for managing image records and related patient, study, series information.
- Apache 2.x HTTP server and PHP scripting engine for presenting a web-based user interface for browsing and managing database records.
- ImageMagick PHP module for displaying Dicom images through client's web browsers.
- An optional HL7 Message Listener module for receiving and sending HL7 messages via Lower-Level Transport Protocol (LLTP)

4 Platforms

The following platforms are currently supported:

- Windows NT 4.0 Workstation or Server
- Windows 2000 Workstation or Server
- Windows XP
- Windows 2003/2008 Server
- Windows Vista/Windows 7
- Linux (kernel version 2.6 or higher)
- Mac OS X (Release 10.4 or later) for Intel/AMD x86 or x86_64 processors

5 Installation

PacsOne Server software can be downloaded from the following URL:

http://www.pacsone.net/download.htm

Refer to the document `PacsOne Installation Guide` for detailed instructions about how to install/upgrade and set up PacsOne Server software.

6 Managing PacsOne User Accounts

After PacsOne Server software has been installed successfully for the first time, there are only two (2) default user accounts created for PacsOne:

- The super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases), which is the Administrator account required to administrate user accounts and set up privilege levels for all users.
- The **`built-in`** system user account which you have created during PacsOne installation. This account is strictly for PacsOne Server internal use, and it is not recommended to use this account to access the PacsOne web user interface since it does not have any associated privilege levels.

6.1 Privacy Attributes

In order to be more compliant with Health Insurance Portability and Accountability Act (HIPAA), all patients and studies stored in the PacsOne database have one of the two (2) privacy attributes below:

- Public: If a patient's privacy attribute is Public, then all studies of this patient and all images within the studies of this patient can be accessed by any PacsOne user account, without any user privilege requirements. If a study's privacy attribute is Public, then all subsequent series of this study and all images within the series of this study can be accessed by any PacsOne user account, without any user privilege requirements.
- Private (Default): If a patient's privacy attribute is Private, then all studies of this patient and all images within the studies of this patient can be accessed by only those PacsOne user account (s) with the '**View**' privilege, or those user accounts whose Last Name and First Name stored in the user profile match with either the Referring Physician Name or the Reading Physician Name, or those group users whose Group Description matches with the Institution Name of this patient.
- PacsOne users without the '**View**' privilege will not be able to access a Private patient or any study or images of the Private patient, unless the user's Last Name and First Name stored in the user profile match with either the Referring Physician Name or Reading Physician Name, or the user belongs to a User Group whose Group Description matches with the Institution Name of the patient.
- If a study's privacy attribute is Private, then all subsequent series of this study and all images within the series of this study can be accessed by only the PacsOne user account (s) with the '**View**' privilege, or those user accounts whose Last Name and First Name stored in the user profile match with either the Referring Physician Name or the Reading Physician Name, or those Group Users whose Group Description matches with the Institution Name of this patient
- PacsOne users without the '**View**' privilege will not be able to access this Private study or any series or images of this study, unless the user's Last Name and First Name stored in the user profile match with either the Referring Physician Name or Reading Physician Name, or the user belongs to a User Group whose Group Description matches with the Institution Name of this study.
- All patients and studies are stored as Private when they are received by PacsOne. Only PacsOne users with '**Modify**' privilege can change the privacy attribute of a patient or study from Private to Public or vice versa.
- Changing a patient from Private to Public will implicitly change all studies of the patient to Public, regardless of their previous settings.
- Changing a patient from Public to Private will implicitly change all studies of the patient to Private, regardless of their previous settings.
- Changing a study from Private to Public does not affect the privacy setting of the patient who this study belongs to, except when this study is the only study of the patient. The patient will also be changed from Private to Public if and only if the study being changed is the only study of that patient.
- Changing a study from Public to Private does not affect the privacy setting of the patient who this study belongs to, except when this study is the only study of the patient. The patient will also be changed from Public to Private if and only if the study being changed is the only study of that patient.
- User Access Filters – The Administrator can define optional **User Access Filters** to allow this user access to the specific patient or study with the matching Dicom data element filter values. The following list of Dicom Data Elements is supported as the filtering attribute:

  - Source AE Title
  - Referring Physician's Name
  - Reading Physician's Name
  - Institution Name

  If multiple filters are defined, then the logical **AND (&&)** operator will be applied for all defined filters

6.2 Creating New User Accounts

Only the Administrator/Super-user ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can create new user accounts, after logging into PacsOne by accessing the following URL:

http://{HOSTNAME}/pacsone/home.php

Where: {HOSTNAME} is the name of the machine where PacsOne is installed, e.g., `localhost`. After logging into PacsOne successfully, the Administrator (‘**`root`**’ for MySQL or ‘**`SYSTEM`**’ for Oracle databases) can click on the ‘`User Administration`’ link from the menu bar to enter the User Administration page as illustrated below:

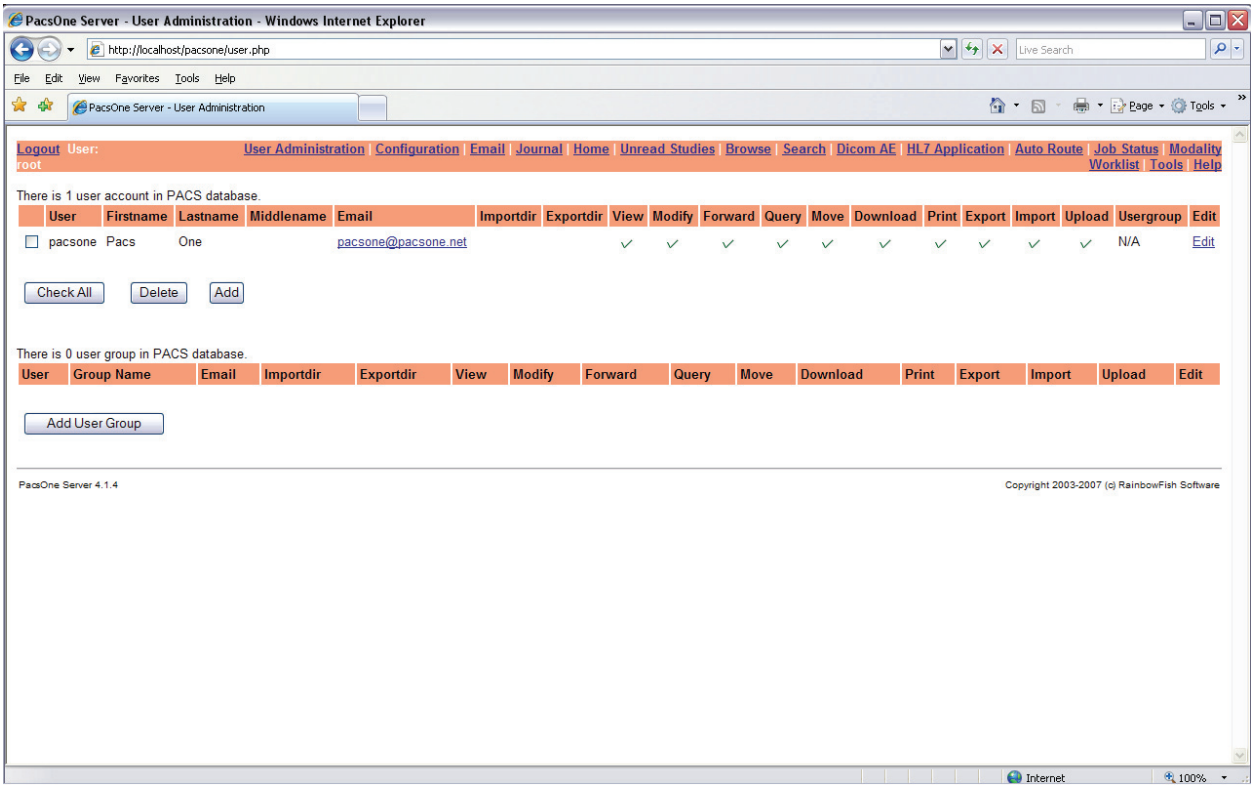
PacsOne Server - User Administration - Windows Internet Explorer
http://localhost/pacsone/user.php
File Edit View Favorites Tools Help
PacsOne Server - User Administration
Logout User: root
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
There is 1 user account in PACS database.
User Firstname Lastname Middlename Email Importdir Exportdir View Modify Forward Query Move Download Print Export Import Upload Usergroup Edit
pacsone Pacs One pacsone@pacsone.net N/A Edit
Check All
Delete
Add
There is 0 user group in PACS database.
User Group Name Email Importdir Exportdir View Modify Forward Query Move Download Print Export Import Upload Edit
Add User Group
PacsOne Server 4.1.4
Copyright 2003-2007 (c) RainbowFish Software
Internet
100%

Figure 1 User Accounts Administration

Clicking on the ‘**`Add`**’ button will display the “`Add New User`” page as illustrated below:

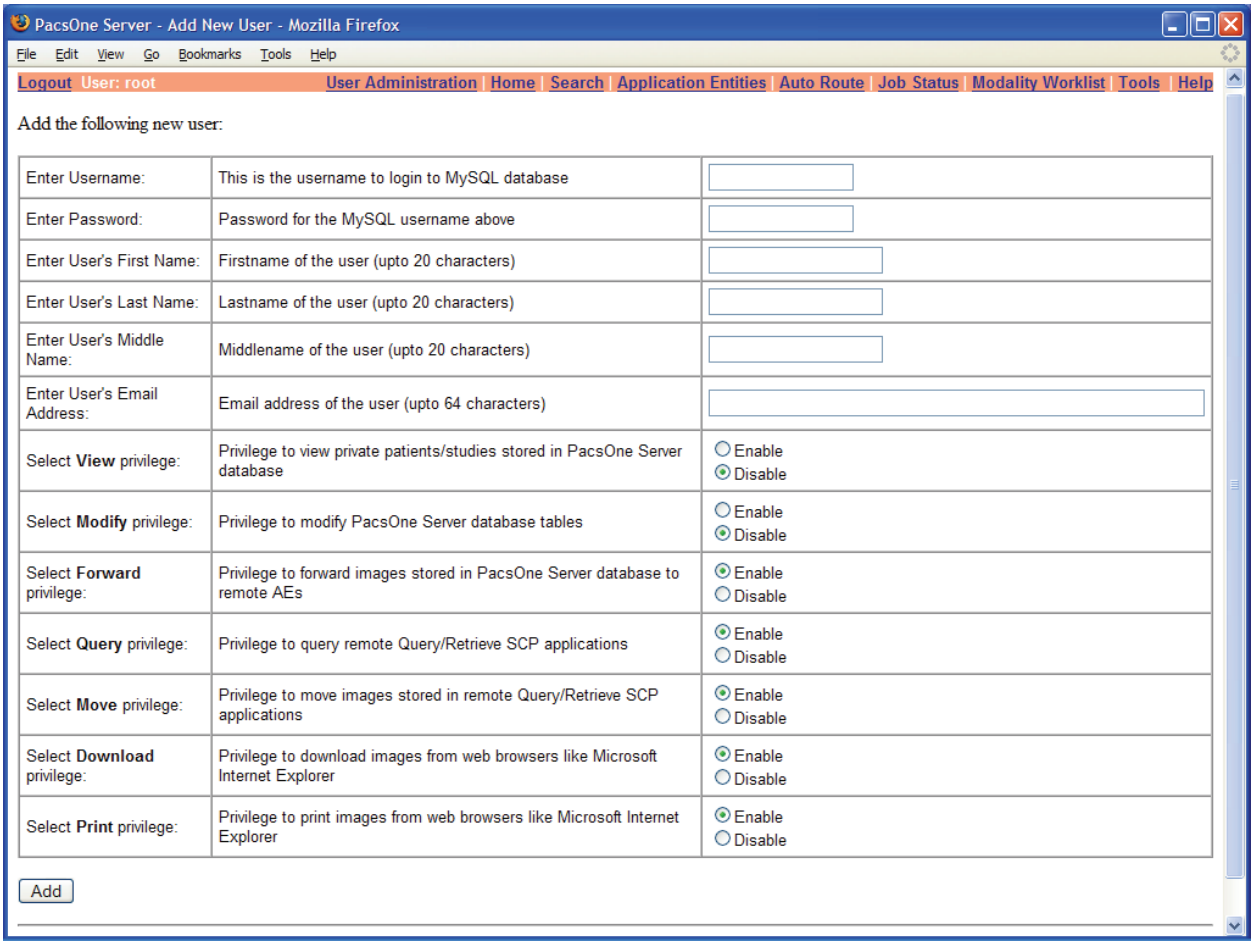
PacsOne Server - Add New User - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
Logout User: root
User Administration | Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Add the following new user:
Enter Username:
This is the username to login to MySQL database
Enter Password:
Password for the MySQL username above
Enter User's First Name:
Firstname of the user (upto 20 characters)
Enter User's Last Name:
Lastname of the user (upto 20 characters)
Enter User's Middle Name:
Middlename of the user (upto 20 characters)
Enter User's Email Address:
Email address of the user (upto 64 characters)
Select View privilege:
Privilege to view private patients/studies stored in PacsOne Server database
Enable
Disable
Select Modify privilege:
Privilege to modify PacsOne Server database tables
Enable
Disable
Select Forward privilege:
Privilege to forward images stored in PacsOne Server database to remote AEs
Enable
Disable
Select Query privilege:
Privilege to query remote Query/Retrieve SCP applications
Enable
Disable
Select Move privilege:
Privilege to move images stored in remote Query/Retrieve SCP applications
Enable
Disable
Select Download privilege:
Privilege to download images from web browsers like Microsoft Internet Explorer
Enable
Disable
Select Print privilege:
Privilege to print images from web browsers like Microsoft Internet Explorer
Enable
Disable
Add

Figure 2 Creating New User Account

For each user, there're 12 privileges that can be administrated separately by the super-user/Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases):

Privilege	Description	Default
View	Required to view private patients/studies	Disabled
Modify	Required to change database attributes	Disabled
Forward	Required to forward images stored in PacsOne to a remote SCP	Enabled
Query	Required to query remote Query/Retrieve SCP application entities	Enabled
Move	Required to move images on remote Query/Retrieve SCP application entities	Enabled
Download	Required to download PacsOne images from a web browser	Enabled
Print	Required to print images to Dicom printers	Enabled
Export	Required to export images stored in local PacsOne Server database to Dicom Standard Part 10 formatted directory and files with DICOMDIR directory information	Enabled
Import	Required to import external Dicom formatted directory and/or raw image files into PacsOne Server database	Enabled
Upload	Required to upload text files, PDF/Word documents, audio/video clips, etc. into PacsOne Server database	Disabled
Monitor	Required to access system monitoring activities such as system logs, live monitors, etc.	Disabled
Mark Study	Required to mark a study as either Read or Un-read	Disabled

System Administration	Required to access system-level configurations such as Email Server, System Configuration, Journal, or System-level Job Status, etc.	Disabled
Change Storage	Required to move selected Dicom studies to a user-specified storage location	Disabled

Table 3 PacsOne User Privileges

NOTE: The Super-user/Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases) has all of the above privileges.

With the above privilege levels, there are three (3) categories of users that can be defined for PacsOne Server Premium Edition:

Category	Description
Administrator	This is the pre-defined user account '**root**' for MySQL or '**SYSTEM**' for Oracle databases. There is only one (1) such account and it is required to perform all user administration tasks.
System Administrators	These are the user accounts with the '**System Administration**' privilege Enabled by the Administrator. These users can access system-level configuration information such as the Email Server, System Configuration, Journal, or System-level Job Status pages, etc.
Power Users	These are the user accounts with the '**Modify**' and '**View**' privileges Enabled by the Administrator. These users can access all `Public` and `Private` patients/studies in the database, and they can also modify and delete existing database records.
Regular Users	These accounts are usually created for the referring physicians or reading physicians. They do not have the '**View**' privilege and can only access the `Public` patients/studies, or the `Private` patients/studies whose `Referring/Reading Physician Name` matches with the `Last Name` and `First Name` of the user profile.

Table 4 PacsOne Server User Categories

6.2.1 Creating Group User Accounts

Clicking on the '**`Add User Group`**' button will display the "`Add New User Group`" page as illustrated below:

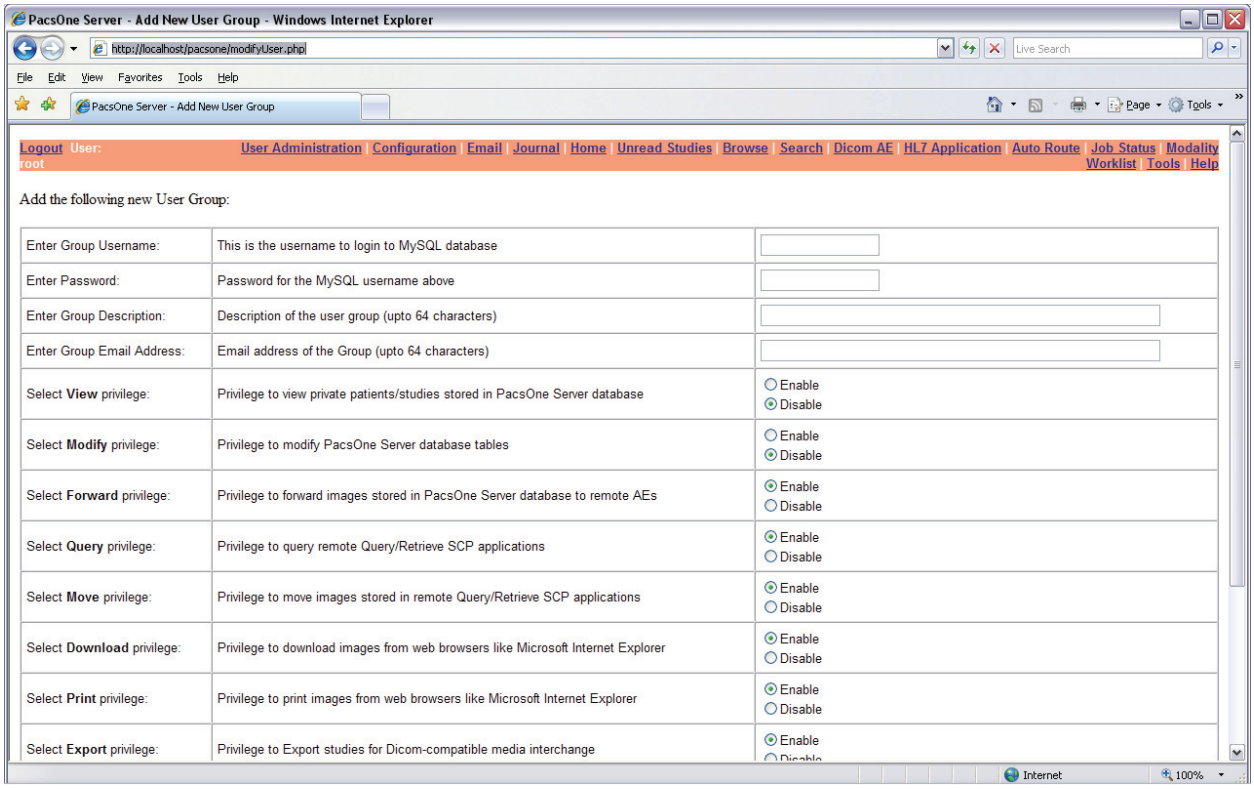
PacsOne Server - Add New User Group - Windows Internet Explorer
http://localhost/pacsone/modifyUser.php
File Edit View Favorites Tools Help
PacsOne Server - Add New User Group
Logout User: root
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
Add the following new User Group:
Enter Group Username: This is the username to login to MySQL database
Enter Password: Password for the MySQL username above
Enter Group Description: Description of the user group (upto 64 characters)
Enter Group Email Address: Email address of the Group (upto 64 characters)
Select View privilege: Privilege to view private patients/studies stored in PacsOne Server database
Select Modify privilege: Privilege to modify PacsOne Server database tables
Select Forward privilege: Privilege to forward images stored in PacsOne Server database to remote AEs
Select Query privilege: Privilege to query remote Query/Retrieve SCP applications
Select Move privilege: Privilege to move images stored in remote Query/Retrieve SCP applications
Select Download privilege: Privilege to download images from web browsers like Microsoft Internet Explorer
Select Print privilege: Privilege to print images from web browsers like Microsoft Internet Explorer
Select Export privilege: Privilege to Export studies for Dicom-compatible media interchange
Enable
Disable
Internet
100%

Figure 3 Creating Group User Accounts

A Group User account has almost the same attributes as a normal user account, e.g., username/password, email address, privileges, etc., except that the `Group Description` of a Group User account is used by PacsOne Server to match against the `Institution Name` of a private patient/study, when determining if the Group User can access that private patient/study. In addition to all the privileges of a regular user account, a Group User has the following configurable options that can be administered only for Group Users:

Option	Description	Default
Group Share	If this privilege is enabled, PacsOne Server will check all users of the group and see if any of them has a matching Referring, Reading or Requesting Physician's Name of a private study, to determine whether users of the group can access that private study. For example, if a user of this group has a matching last name/first name with either the Referring, Reading or Requesting Physician's Name of a private study, and this privilege is enabled for the Group of that user, then all other users of this group can access the same private study.	Disabled
Sub-String Group Matching	If this option is enabled, then instead of using **Exact-Matching** method when checking if this group has access to a private patient, PacsOne Server will check whether the **Group Description** of this group is a sub-string of the **Institution Name** of that patient.	Disabled

Table 5 Options Specific for Group Users

6.3 Deleting Existing User Accounts

Only the Administrator/Super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases) can delete existing PacsOne user accounts from the `User Administration` page, by clicking the individual checkbox before the PacsOne username (or click the '**`Check All`**' button to delete all existing users) followed by the '**`Delete`**' button.

6.4 Modifying Existing User Accounts

Only the Administrator/Super-user ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can modify existing PacsOne user accounts from the `User Administration` page, by clicking the '**Edit**' link for the particular user account that needs to be modified.

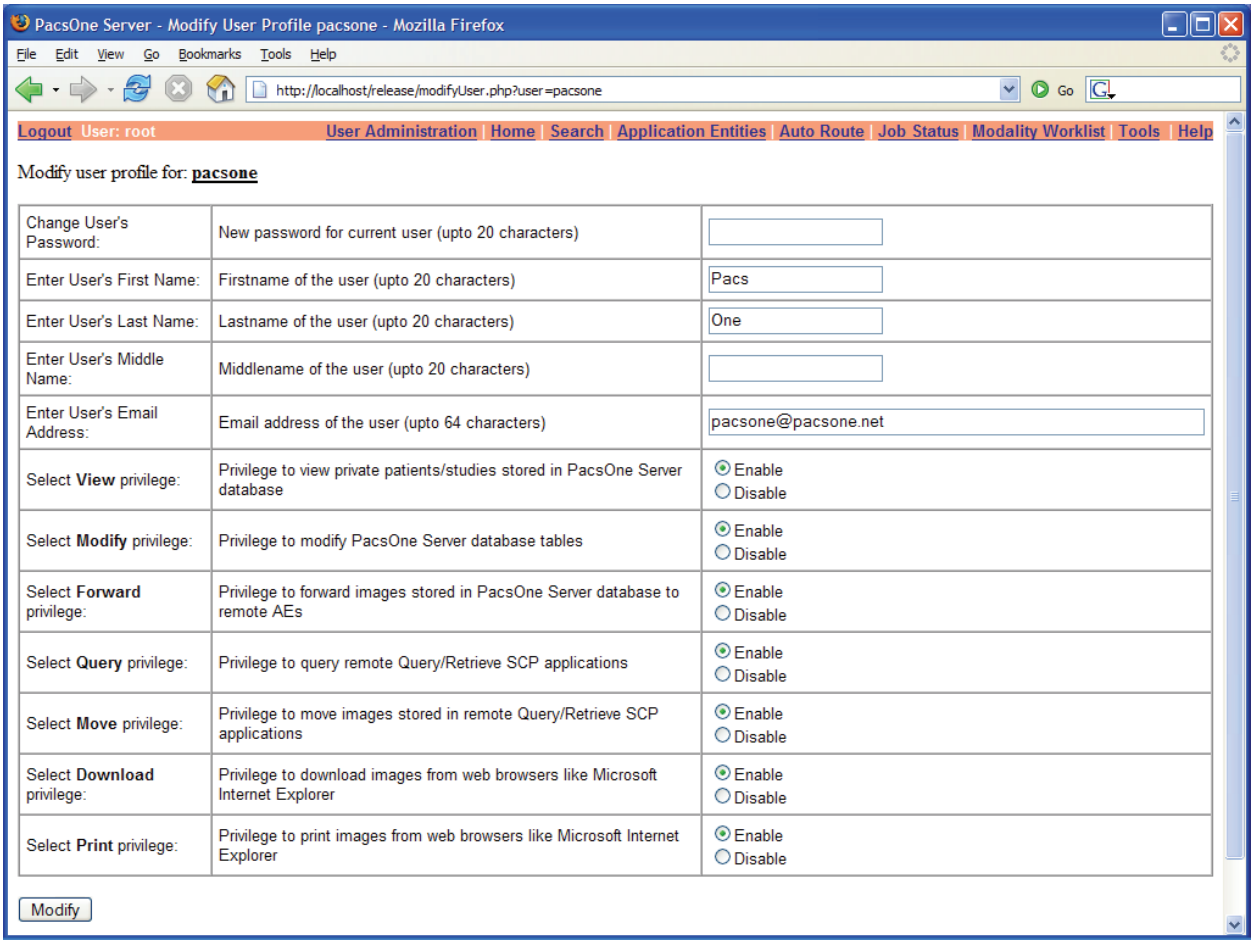
PacsOne Server - Modify User Profile pacsone - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/release/modifyUser.php?user=pacsone
Go
Logout User: root
User Administration | Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Modify user profile for: pacsone
Change User's Password:
New password for current user (upto 20 characters)
Enter User's First Name:
Firstname of the user (upto 20 characters)
Pacs
Enter User's Last Name:
Lastname of the user (upto 20 characters)
One
Enter User's Middle Name:
Middlename of the user (upto 20 characters)
Enter User's Email Address:
Email address of the user (upto 64 characters)
pacsone@pacsone.net
Select View privilege:
Privilege to view private patients/studies stored in PacsOne Server database
Select Modify privilege:
Privilege to modify PacsOne Server database tables
Select Forward privilege:
Privilege to forward images stored in PacsOne Server database to remote AEs
Select Query privilege:
Privilege to query remote Query/Retrieve SCP applications
Select Move privilege:
Privilege to move images stored in remote Query/Retrieve SCP applications
Select Download privilege:
Privilege to download images from web browsers like Microsoft Internet Explorer
Select Print privilege:
Privilege to print images from web browsers like Microsoft Internet Explorer
Enable
Disable
Modify

Figure 4 Modifying Existing User Account

The user's password, first name, last name, middle name can be modified, and all of the six (6) privileges can be independently Enabled or Disabled for this user account.

7 System Configuration

The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) of PacsOne Server can configure the following system parameters by clicking on the **Configuration** link from the **Main Menu** bar:

- `Default Short-term Archive Directory` – This is the directory where the received images will be stored if there is no specific short-term archive directory defined for the source AE
- `Default Archive Directory Format` – This parameter controls the directory hierarchy under the designated archive directory. There are two (2) options:

  - Flat - Received images are stored under **%Assigned Directory%/YYYY-MM-DD-WEEKDAY/** sub-folders
  - Hierarchical - Received images are stored under **%Assigned Directory%/YYYY/MM/DD/** sub-folders
  - Study Instance UID - Received images are stored under **%Assigned Directory%/%StudyUid%/** sub-folders, where **%StudyUid%** is the Study Instance UID of the received Dicom studies
- Automatically Age From Default Short-Term Archive Directory To Default Long-Term Archive Directory – If this option is enabled, PacsOne Server will automatically move images stored under the default short-term archive directory that were received more than **N** days ago, to the default long-term directory specified by the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases)
- Date and Time Schedule for Automatic Aging from Short-term to Long-term Archive Directory – This parameter controls the schedule when PacsOne Server will perform the automatic aging to move images from short-term to long-term directories. The default schedule is every Sunday morning at 01:00 a.m. local time.
- Browser Automatic Logout Period – This parameter controls the timeout/idle period (in minutes) for automatic logging out client browsers. The default value is 10 minutes
- User Password Expiration Period – This parameter controls the time period for automatic user password expiration, users need to select a new password when their passwords expire. The default value is 60 days
- Maximum Upload File Size – This parameter controls the maximum file size limit when users upload files. The default value is 2 MB. The smaller value of this parameter and the **upload_max_filesize** variable in your '**PHP.INI**' file controls the maximum file size limit when users upload files
- Upload Directory – This is the local directory used to store user-uploaded attachments and Dicom Part-10 formatted raw images. The default value is the **'upload'** sub-folder where PacsOne Server is installed
- Upload Attachment – Whether PacsOne Server should store uploaded attachment into the database table directly, or store them as regular files under the above **'Upload Directory'**. The default is to store attachment into the database table directly
- Directory for Storing Thumbnail JPG/GIF Images – This is the directory used to store the cached thumbnail .jpg/.gif images displayed to the browsers. The default is to store the .jpg/.gif images under the "**php/thumbnails**" sub-folder where PacsOne is installed
- Directory for Storing Full-Size JPG/GIF Images – This is the directory used to store the cached full-size .jpg/.gif images displayed to the browsers. The default is to store the .jpg/.gif images under the "**php/images**" sub-folder where PacsOne is installed
- Auto-Scan Directory – The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can enable or disable this feature, and if enabled, PacsOne will automatically scan the configured **Source Directory**, using the configured scan interval:

  - Source Directory – If enabled, PacsOne Server will automatically scan this local directory for any Dicom Part-10 formatted images with the "***.dcm**" filename extension. If the image are indeed Dicom Part-10 formatted but the image files do not end with the "***.dcm**" filename extension, you can force PacsOne Server to scan all files under this source directory, by adding the following Registry value (for Windows users):

    ```
    HKEY_LOCAL_MACHINE\Software\RainbowFish
    Software\PacsOne\${AeTitle}\AutoScanAnyFile
    ```

    And set the DWORD value to 1.

    For Linux/Mac OS X users, the same configuration can be set by adding the following line to the **"${AeTitle}.ini"** file under the directory where PacsOne is installed:

```
AutoScanAnyFile = 1
```

- `Destination Folder` – If PacsOne Server has found and scanned any Dicom Part-10 formatted image in the **`Source Directory`**, it will move the image to this **`Destination Folder`** and parse it into the PacsOne Server database
- `Scan Interval` – Time interval (in seconds) for the period scan of the above **`Source Directory`**. The default value is 60 seconds and the Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases) can set it to any value larger than 60 seconds

This Auto-Scan feature is by default **`Disabled`** and can only be enabled by the Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases).

- `Administrator's Email Address` – This is the email address where the automatically-generated emails (e.g., Statistics Reports, System Journal Logs, etc.) will be delivered to. Multiple email addresses can be entered by using the coma ('`,`') as the separator in between the addresses.
- `Path to PHP Runtime Executable` – Full path to the PHP runtime executable program ('**`php.exe`**'). Default is "**`C:\php\php.exe`**" for Windows platforms, or "**`/usr/local/bin/php`**" for Linux/MacOS. This is required because PacsOne Server uses PHP internally to send outgoing emails.
- `Email Notify Users About Failed Jobs` – If enabled, PacsOne Server will send email notifications to registered user's email address (if defined) about any failed job submitted by that user.

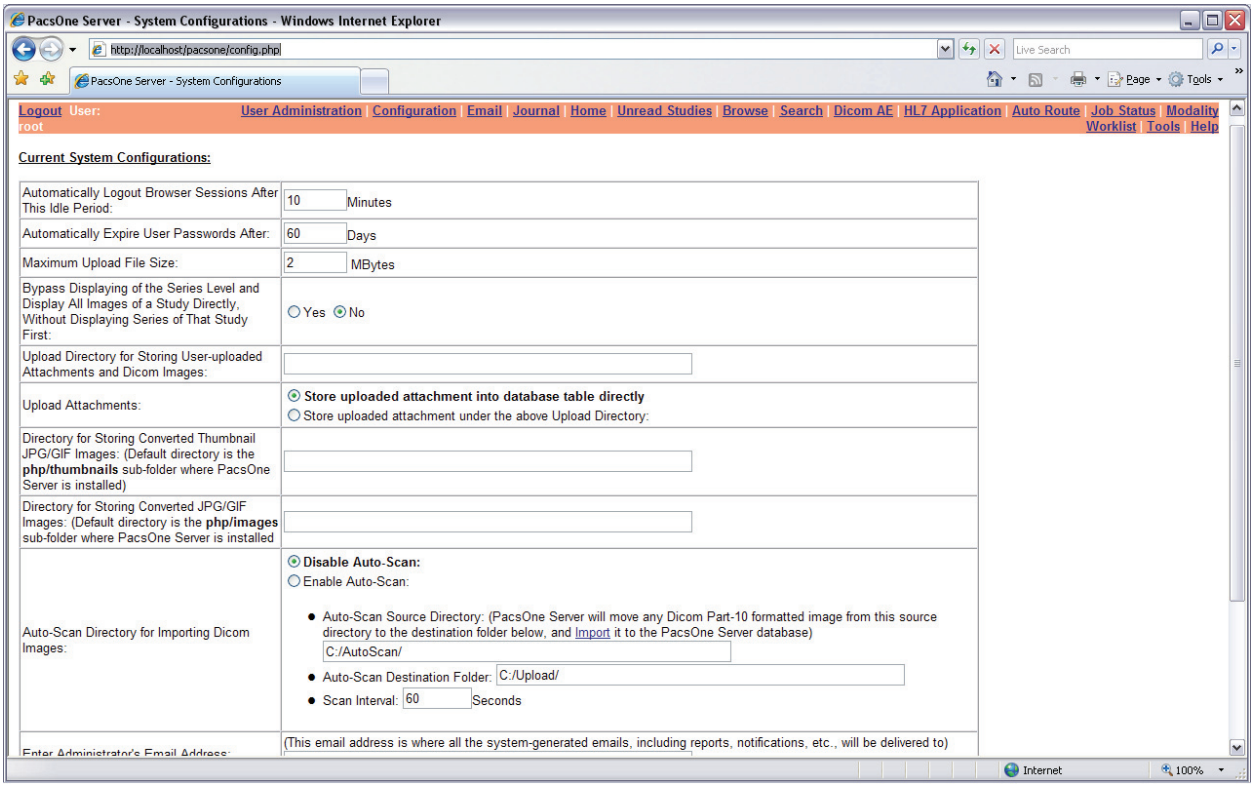
PacsOne Server - System Configurations - Windows Internet Explorer
http://localhost/pacsone/config.php
PacsOne Server - System Configurations
Logout User: root
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
Current System Configurations:
Automatically Logout Browser Sessions After This Idle Period: 10 Minutes
Automatically Expire User Passwords After: 60 Days
Maximum Upload File Size: 2 MBytes
Bypass Displaying of the Series Level and Display All Images of a Study Directly, Without Displaying Series of That Study First: Yes No
Upload Directory for Storing User-uploaded Attachments and Dicom Images:
Upload Attachments: Store uploaded attachment into database table directly
Store uploaded attachment under the above Upload Directory:
Directory for Storing Converted Thumbnail JPG/GIF Images: (Default directory is the php/thumbnails sub-folder where PacsOne Server is installed)
Directory for Storing Converted JPG/GIF Images: (Default directory is the php/images sub-folder where PacsOne Server is installed
Auto-Scan Directory for Importing Dicom Images:
Disable Auto-Scan:
Enable Auto-Scan:
Auto-Scan Source Directory: (PacsOne Server will move any Dicom Part-10 formatted image from this source directory to the destination folder below, and Import it to the PacsOne Server database)
C:/AutoScan/
Auto-Scan Destination Folder: C:/Upload/
Scan Interval: 60 Seconds
(This email address is where all the system-generated emails, including reports, notifications, etc., will be delivered to)
Internet
100%

Figure 5 System Configuration Page

- `Automatic Patient Reconciliation` – If enabled, PacsOne Server will use the patient demographics information (Patient ID, Patient Name and Date of Birth) from the Dicom Modality Worklist (DMWL) data or the HL7 Patient Order (ORM) messages to match with the same information contained in the received Dicom studies, and will automatically correct the Patient Name if there is any discrepancy found in the received Dicom studies. For example, if the scheduled DMWL/HL7 ORM data has a patient with the Patient ID of "`12345`", Patient Name of "`Doe^John`" and DOB of "`2007-10-18`", then a Dicom study is received with the same Patient ID and DOB, but different Patient Name of

"Doe^Johnny". In this case, if the **Automatic Patient Reconciliation** feature is enabled, PacsOne Server will automatically correct the Patient Name in this received Dicom study to "Doe^John" to match with the Patient Name in the DMWL/HL7 ORM data, and log this event to the **Patient Reconciliation** table described in Section 13.14.13.

- Automatic Study Reconciliation – If enabled, PacsOne Server will use the study related information (Referring Physician's Name, Requesting Physician's Name) from the Dicom Modality Worklist (DMWL) data to match with the same information contained in the received Dicom studies, and will automatically correct the Referring Physician's Name and/or Requesting Physician's Name if there is any discrepancy found in the received Dicom studies. For example, if the DMWL data has a procedure scheduled with the Referring Physician's Name of "Doe^John", then a Dicom study is received with the same Study Instance UID but different Referring Physician's Name of "Doe^Johnny". In this case, if the **Automatic Study Reconciliation** feature is enabled, PacsOne Server will automatically correct the Referring Physician's Name in this received Dicom study to "Doe^John" to match with the Referring Physician's Name from the DMWL data
- Auto-Scan Directory for Worklist Data – The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can enable or disable this feature, and if enabled, PacsOne will automatically scan the configured **Source Directory**, using the configured scan interval:

    - Source Directory – If enabled, PacsOne Server will automatically scan this local directory for any text files that may contain the Dicom Modality Worklist (DMWL) data. The format of the worklist text file is specified in Section 13.14.11.
    - Scan Interval – Time interval (in seconds) for the period scan of the above **Source Directory**. The default value is 60 seconds and the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can set it to any value larger than 60 seconds

  This Auto-Scan Worklist feature is by default **Disabled** and can only be enabled by the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases).
- Enable Statistics Report Emails – The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can enable or disable the checkboxes for the daily, weekly, or monthly statistics report emails, as well as the monthly journal report emails, that are sent to the Administrator's email address.
- Enable Automatic Conversion of Received Dicom Images into Thumbnail/Full-size JPG/GIF images – If enabled by the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases), PacsOne Server will automatically convert received Dicom images into the thumbnail/full-size JPG/GIF images upon reception, so that the converted JPG/GIF images can be loaded much faster by the web browsers when comparing to the case where the JPG/GIF images must be converted on-demand.
- Enable Display of Veterinary Specific Information – If enabled by the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases), PacsOne Server will display database columns or information that are specific for veterinary systems, for example, patient species, patient breed, owner, etc.
- Select Specific Character Set – Instead of the Dicom default character set (ISO IR-6), the Administrator can select from the following non-default character sets:

    - Simplified Chinese - ISO IR-192/GB18030
    - Korean - ISO IR-149
    - Japanese JIS X 0201 – ISO IR-13
    - Japanese JIS X 0208 – ISO IR-87
    - Japanese JIS X 0212 – ISO IR-159
    - Unicode - ISO IR-192

- Web Access to DICOM Persistent Objects (WADO) Security Model – PacsOne Server requires authentication (username/password) for Web Access to DICOM Persistent Objects (WADO). There are 2 authentication methods supported:

- Use Username/Password from HTTP GET/POST Request or Basic Authentication
- Use Pre-Configured Username/Password

Either method requires the specified username/password to be valid, and should be pre-configured by the Administrator from the "**User Administration**" page described in Section 6.

- Website URL to embed in statistics report emails for external access – This configuration is used to embed website URL in the statistics report emails sent from PacsOne Server, so that users can simply click on the embedded URL link in the emails to launch a web browser to access the URL-linked Dicom studies. The website URL should be the external domain name (DNS) or IP address of the web server where PacsOne Server database is hosted, e.g., http://192.168.0.100/pacsone/, etc.

8 SMTP Server Configuration

The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) of PacsOne Server can configure a SMTP server for sending outgoing emails, by clicking on the **Email** link from the Main Menu, and enter the following information:

- SMTP Server Hostname or IP Address – This is the hostname or IP address of the SMTP server, which can be either the same server (localhost) or a remote host
- Port Number – The TCP port number the SMTP server listens to. Default is 25
- Description – Text description of this SMTP server
- From: Email Address – This is the email address used in the **From:** field in outgoing email messages
- Authentication Type – SMTP authentication type. Can be set to one of the following:
  - None – No other configuration is required
  - LOGIN, CRAM-MD5, or PLAIN – A valid username/password pair is required
  - NTLM – A valid username/password pair, and the hostname of the NTLM Workstation are required

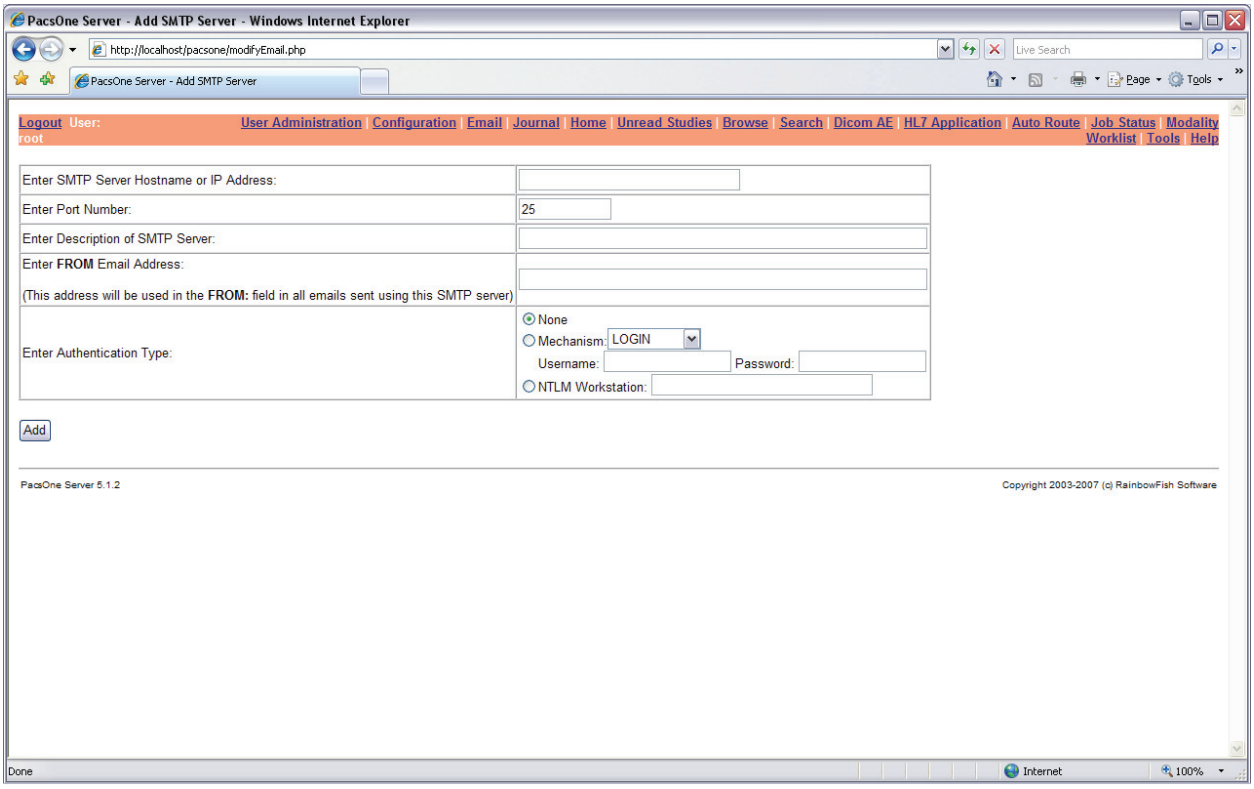
PacsOne Server - Add SMTP Server - Windows Internet Explorer
http://localhost/pacsone/modifyEmail.php
PacsOne Server - Add SMTP Server
Logout User: root
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
Enter SMTP Server Hostname or IP Address:
Enter Port Number:
25
Enter Description of SMTP Server:
Enter FROM Email Address:
(This address will be used in the FROM: field in all emails sent using this SMTP server)
Enter Authentication Type:
None
Mechanism: LOGIN
Username:
Password:
NTLM Workstation:
Add
PacsOne Server 5.1.2
Copyright 2003-2007 (c) RainbowFish Software
Done
Internet
100%

Figure 6 Configuring SMTP Server

9 System Journal Log

To support HIPAA Auditing requirements, PacsOne Server automatically logs all user activities into the **System Journal Log** table, and only the Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases) can access this table by clicking on the **`System Journal`** link from the Main Menu. The following information will be displayed from the **System Journal Log**:

- `When` – The date and time when the event took place
- `Username` – The username for which the event was logged
- `Operation` – The operation this user performed for which the event was logged
- `Level` – The subject level of this event, e.g., Patient, Study, Series, Image, etc.
- `UID` – The unique ID identifying this event, e.g., Patient ID, Study/Series/Instance UID, etc.
- `Details` – The details of this event

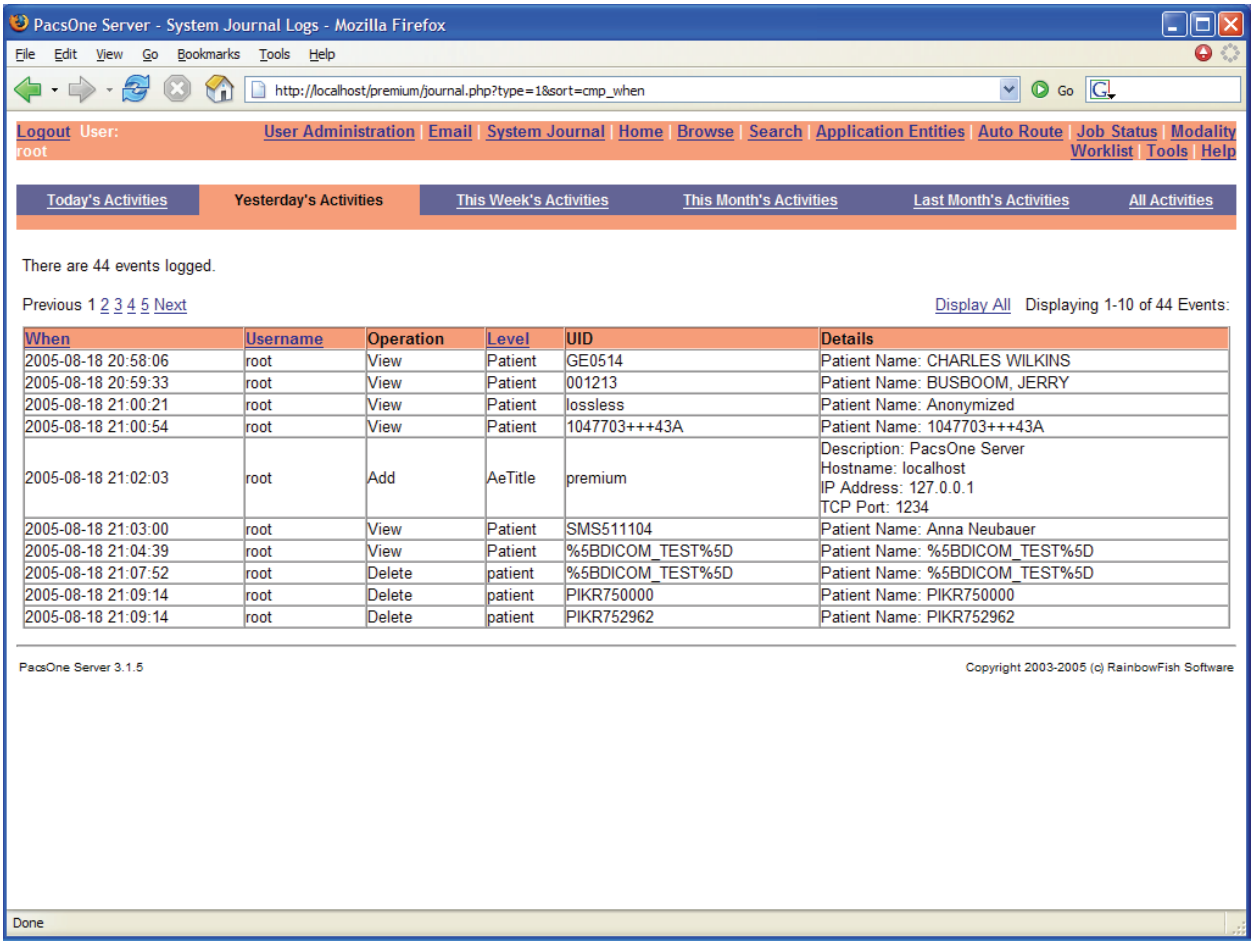
PacsOne Server - System Journal Logs - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/premium/journal.php?type=1&sort=cmp_when
Logout User: root
User Administration | Email | System Journal | Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Today's Activities | Yesterday's Activities | This Week's Activities | This Month's Activities | Last Month's Activities | All Activities
There are 44 events logged.
Previous 1 2 3 4 5 Next
Display All Displaying 1-10 of 44 Events:
When | Username | Operation | Level | UID | Details
2005-08-18 20:58:06 | root | View | Patient | GE0514 | Patient Name: CHARLES WILKINS
2005-08-18 20:59:33 | root | View | Patient | 001213 | Patient Name: BUSBOOM, JERRY
2005-08-18 21:00:21 | root | View | Patient | lossless | Patient Name: Anonymized
2005-08-18 21:00:54 | root | View | Patient | 1047703+++43A | Patient Name: 1047703+++43A
2005-08-18 21:02:03 | root | Add | AeTitle | premium | Description: PacsOne Server Hostname: localhost IP Address: 127.0.0.1 TCP Port: 1234
2005-08-18 21:03:00 | root | View | Patient | SMS511104 | Patient Name: Anna Neubauer
2005-08-18 21:04:39 | root | View | Patient | %5BDICOM_TEST%5D | Patient Name: %5BDICOM_TEST%5D
2005-08-18 21:07:52 | root | Delete | patient | %5BDICOM_TEST%5D | Patient Name: %5BDICOM_TEST%5D
2005-08-18 21:09:14 | root | Delete | patient | PIKR750000 | Patient Name: PIKR750000
2005-08-18 21:09:14 | root | Delete | patient | PIKR752962 | Patient Name: PIKR752962
PacsOne Server 3.1.5
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 7 System Journal Log

The Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) can choose from the following time-based views of the events logged in the **System Journal Log**:

- Today's Activities
- Yesterday's Activities
- This Week's Activities
- This Month's Activities
- Last Month's Activities
- All Activities

9.1 Automatic Monthly System Journal Log Emails

If a valid SMTP server and the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases)'s email address have been configured (See Section 7 above), then on the first day of every month, PacsOne Server will automatically send an email with all events in the **System Journal Log** during the previous month to the configured Administrator's email address.

9.2 Automatic Purging Aged System Journal Log

On the first day of every month, PacsOne Server will automatically purge older events logged in the **System Journal Log** that occurred before the first day of the previous month.

To change the purge interval for system journal logs from the default 60 days, users can add or modify the following Registry value:

```
HKEY_LOCAL_MACHINE\Software\Rainbowfish Software\PacsOne\{AETITLE}\JournalPurgeInterval
```

Set or change the DWORD value to the Number of Days in which the older system journal logs will be purged.

10 Application Entity Table

Before PacsOne can communicate with other DICOM compliant application entities, they need to be configured properly in the `Application Entity` table as described below:

Column	Description	SCU or SCP Role	Default
Title	Application Entity (AE) Title. This is the key of this table.	Both	N/A
Hostname	Hostname of the remote AE. This is used to lookup the IP address of the remote AE if the IP address is not defined.	Both	None
IP Address	IP address of the remote AE.	Both	None
Port	TCP port number of the remote AE.	SCP	None
Database Access	'`Enable`' or '`Disable`' access to PacsOne database for this remote application entity. If set to '`Disable`', PacsOne server will reject any association requests with the specified application entity title.	Both	Disabled
Allow Dicom Commands	Enable or Disable the following individual Dicom commands sent from the remote AE: ♦ C-FIND ♦ C-MOVE ♦ C-STORE ♦ C-FIND ♦ Modality Worklist - FIND Data element or key-based filters can be defined for each of the above enabled commands. Please refer to Section 10.1 below about how to configure command filters for SCU application entities.	SCU	Allow **C-FIND**, **C-STORE**, **C-MOVE** and **Modality Worklist – FIND** with no filters
Short-Term Archive Directory	Short-term archive directory path for this AE. This field is required for C-STORE SCU clients. PacsOne Server will store received images under this directory based on the **Archive Directory Format** for this AE.	SCU	None
Archive Directory Format	Either **Flat** or **Hierarchical** format for storing images received from this AE. Please refer to Section 10.1 below for more details.	SCU	Flat format
Long-Term Archive Directory	Long-term archive directory path for this AE. If this field is defined and **Automatic Aging** is enabled for this AE, PacsOne will automatically age/move images stored in the Short-Term Archive Directory to this Long-Term Archive Directory.	SCU	None
Send Email Notification	Send email notification to the user registered as the Referring Physician when a new Dicom study from	SCU	No

	this AE is received.		
Compress Received Images	Compress images received from this AE via the selected Dicom compression transfer. Please refer to Section 15 below for more details	SCU	Disabled
Query SCP	Boolean flag indicating whether this remote AE is a DICOM Query/Retrieve SCP or not.	SCP	False
Worklist SCP	Boolean flag indicating whether this remote AE is a DICOM Modality Worklist Management SCP or not.	SCP	False
Print SCP	Boolean flag indicating whether this remote AE is a DICOM Printer or not.	SCP	False
Storage Commitment Report SCP	Boolean flag indicating whether this remote AE is a DICOM Storage Commitment Report SCP or not. If the "**Request Storage Commitment Report for Dicom images sent to this SCP**" option is enabled for this SCP, PacsOne Server will request for Storage Commitment Report for any image sent to this SCP.	SCP	False
Maximum Outgoing Sessions	The maximum number of simultaneous outgoing connections PacsOne Server will establish with the remote AE.	SCP	10
Preferred Transfer Syntax Tx	Users can define a preferred transfer syntax for this AE, so that PacsOne will prefer to use this defined transfer syntax when sending images to this remote AE.	SCP	Use original transfer syntax when image was received
Separate Dicom Presentation Context	If this option is enabled, PacsOne Server will propose a separate Dicom Presentation Context for each supported Transfer Syntax when sending images to this destination AE.	SCP	No
Preferred Transfer Syntax Rx	Users can define a preferred transfer syntax for this Source AE, so that PacsOne will prefer to use this defined transfer syntax when receiving images from this Source AE.	SCU	None
Mark Retrieved Studies as Read	Mark studies retrieved to this AE as **Read** with the AE Title of this AE.	SCP	No
Job Queue Priority	Job queue priority when processing database jobs with this destination AE (default priority is 0 - Normal. Database jobs with higher priority destination AEs will be processed before those jobs with lower priority destination AEs).	SCP	0
Anonymize Received Studies	Anonymized studies received from this AE via the syntax rules in a pre-defined template. Please refer to Section 13.14.14 below for more details.	SCU	Disabled
Assign Dicom Studies Received From This AE To Web Users	Assign Dicom studies received from this Source AE to specified web users.	SCU	Disabled
AE Group Settings	Configure one or more individual Source AEs as a group, so that the group AE can be used as the Destination AE for Automatic Routing. Please refer to Section 10.2.3 below for more details.	SCP	No

Table 6 Application Entity Table

For security purposes, only those users with '**`Modify`**' privilege can create, modify or delete entries in the `Application Entity` table. Click on the '`Application Entity`' link from the Main Menu bar to view, add, modify or delete entries in the `Application Entity` table, which is illustrated below:

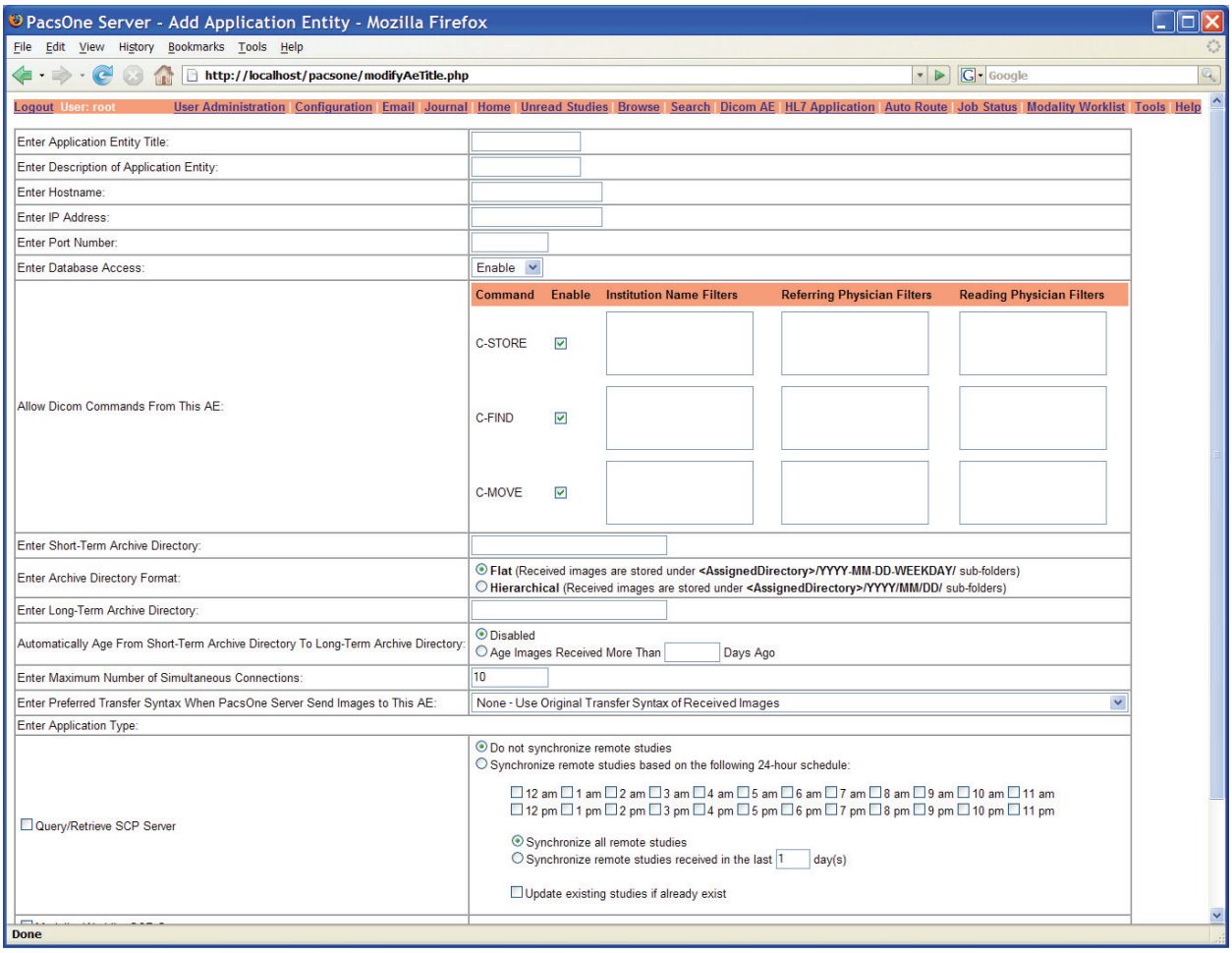
PacsOne Server - Add Application Entity - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost/pacsone/modifyAeTitle.php
Logout User: root
User Administration Configuration Email Journal Home Unread Studies Browse Search Dicom AE HL7 Application Auto Route Job Status Modality Worklist Tools Help
Enter Application Entity Title:
Enter Description of Application Entity:
Enter Hostname:
Enter IP Address:
Enter Port Number:
Enter Database Access:
Enable
Command Enable Institution Name Filters Referring Physician Filters Reading Physician Filters
C-STORE
C-FIND
C-MOVE
Allow Dicom Commands From This AE:
Enter Short-Term Archive Directory:
Enter Archive Directory Format:
Flat (Received images are stored under <AssignedDirectory>/YYYY-MM-DD-WEEKDAY/ sub-folders)
Hierarchical (Received images are stored under <AssignedDirectory>/YYYY/MM/DD/ sub-folders)
Enter Long-Term Archive Directory:
Automatically Age From Short-Term Archive Directory To Long-Term Archive Directory:
Disabled
Age Images Received More Than Days Ago
Enter Maximum Number of Simultaneous Connections:
10
Enter Preferred Transfer Syntax When PacsOne Server Send Images to This AE:
None - Use Original Transfer Syntax of Received Images
Enter Application Type:
Query/Retrieve SCP Server
Do not synchronize remote studies
Synchronize remote studies based on the following 24-hour schedule:
12 am 1 am 2 am 3 am 4 am 5 am 6 am 7 am 8 am 9 am 10 am 11 am
12 pm 1 pm 2 pm 3 pm 4 pm 5 pm 6 pm 7 pm 8 pm 9 pm 10 pm 11 pm
Synchronize all remote studies
Synchronize remote studies received in the last 1 day(s)
Update existing studies if already exist
Done

Figure 8 Adding a New Application Entity

The following attributes are common among all Dicom SCU or SCP applications:

- `AE Title` – Dicom Application Entity (AE) Title string. Maximum of 16 characters with no white-space characters
- `Description` – Text description of this Dicom AE
- `Hostname` – Name of the host where this Dicom AE is located
- `IP Address` – IP address of the host where this Dicom AE is located

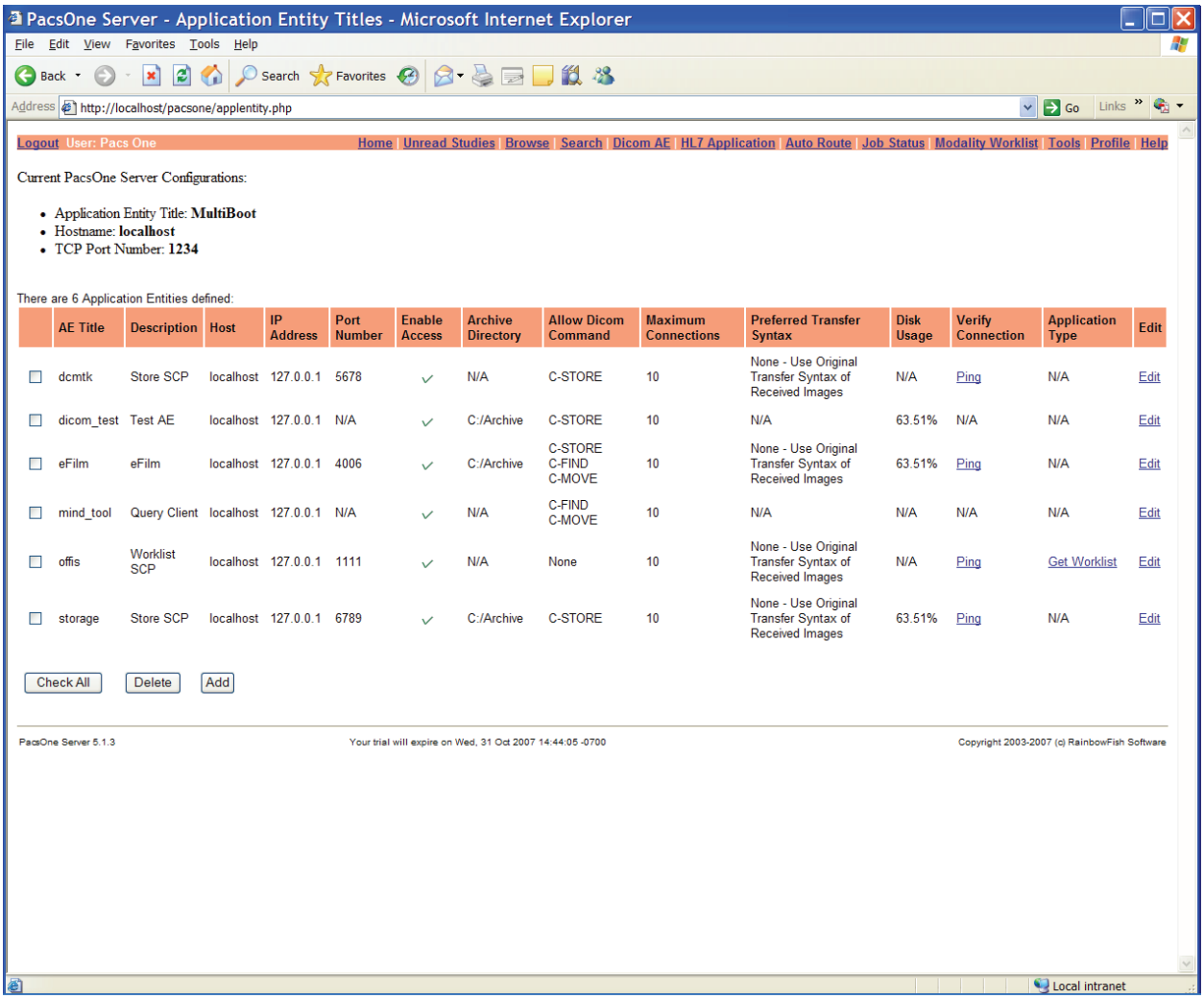
PacsOne Server - Application Entity Titles - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost/pacsone/applentity.php
Go Links
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Current PacsOne Server Configurations:
Application Entity Title: MultiBoot
Hostname: localhost
TCP Port Number: 1234
There are 6 Application Entities defined:
AE Title | Description | Host | IP Address | Port Number | Enable Access | Archive Directory | Allow Dicom Command | Maximum Connections | Preferred Transfer Syntax | Disk Usage | Verify Connection | Application Type | Edit
dcmtk | Store SCP | localhost | 127.0.0.1 | 5678 | ✓ | N/A | C-STORE | 10 | None - Use Original Transfer Syntax of Received Images | N/A | Ping | N/A | Edit
dicom_test | Test AE | localhost | 127.0.0.1 | N/A | ✓ | C:/Archive | C-STORE | 10 | N/A | 63.51% | N/A | N/A | Edit
eFilm | eFilm | localhost | 127.0.0.1 | 4006 | ✓ | C:/Archive | C-STORE C-FIND C-MOVE | 10 | None - Use Original Transfer Syntax of Received Images | 63.51% | Ping | N/A | Edit
mind_tool | Query Client | localhost | 127.0.0.1 | N/A | ✓ | N/A | C-FIND C-MOVE | 10 | N/A | N/A | N/A | N/A | Edit
offis | Worklist SCP | localhost | 127.0.0.1 | 1111 | ✓ | N/A | None | 10 | None - Use Original Transfer Syntax of Received Images | N/A | Ping | Get Worklist | Edit
storage | Store SCP | localhost | 127.0.0.1 | 6789 | ✓ | C:/Archive | C-STORE | 10 | None - Use Original Transfer Syntax of Received Images | 63.51% | Ping | N/A | Edit
Check All
Delete
Add
PacsOne Server 5.1.3
Your trial will expire on Wed, 31 Oct 2007 14:44:05 -0700
Copyright 2003-2007 (c) RainbowFish Software
Local intranet

Figure 9 Application Entity Table Page

10.1 SCU Application Entities

In addition to the columns common to the Application Entity table, i.e., AE Title, Hostname, IP Address, the following SCU specific values will be displayed in the `Application Entity Table` page if the AE is a SCU:

- `Allow Access` – Whether to enable or disable access for this AE
- `Allow Dicom Commands` – Whether to enable or disable Dicom commands (C-STORE, C-FIND, C-MOVE, and Modality Worklist - FIND) sent from this SCU. Additionally for each enabled command, the following data element or key-based filters can be defined to further match the enabled Dicom command:

  - Institution Name – `(0008,0080)`
  - Referring Physician's Name – `(0008,0090)`
  - Reading Physician's Name – `(0008,1060)`

  For each of the above filters, a string pattern (including wild-card characters '*' and '?') can be specified to match against the received image or Dicom command messages. For example:

  - If the Dicom C-FIND command is enabled for a source AE, and a filter for Institution Name is defined with the string pattern of "`Springfield General`", then PacsOne will allow Dicom Queries (C-FIND)

from this source AE, but will only return matching results for those patients with the matching Institution Name of "`Springfield General`".

- If multiple filters are defined for an enabled command, then the filters will be combined with logical OR ('||') operators. For example, if both a filter for Institution Name pattern of "Springfield*", and a filter for Referring Physician's Name pattern of "Dr. Hibbert" are defined for the Dicom C-STORE command, then PacsOne will allow Dicom C-STORE command sent from this source AE, but will only accept images that either pattern match with the Institution Name of "`Springfield*`", or the Referring Physician's Name of "`Dr. Hibbert`".
- For the same filtering key or data element, multiple string patterns can be specified by using the semicolon ('**;**') as the delimiter. For example, for the same Institution Name filter, if the string pattern of "`Springfield* ; Capital City*`" is defined for the Dicom C-STORE command, then PacsOne will only accept images that either pattern match with the Institution Name of "`Springfield*`", or the Institution Name of "`Capital City*`".
- If a Dicom command is enabled for a source AE, but no filter is defined for that command, then PacsOne will always accept that Dicom command sent from the source AE without any filtering.

- `Short-Term Archive Dir` – Short-Term Archive directory for this AE if this AE is a C-STORE SCU.

  - On Windows platforms, this directory path can be set to a folder on a local disk, e.g., **`C:\Images\CT\`**, or it can be set to a network-shared path in Windows Universal Naming Convention (UNC) format, e.g., **`\\Hostname\Dir\SubDir\`**. NOTE: When using network-shared path as archive directories, users must make sure that the Windows local user account (default is '**`SYSTEM`**') PacsOne Server is using has **`Full`** access to the network-shared path
  - On Linux platforms, both the local disks and the network attached storage paths are accessed via the standard UNIX "/" path specifications, e.g., **`/home/images/CT/`**. NOTE: When using network-attached storage path as archive directories, users must make sure that the user account (default is '**`root`**') PacsOne Server is using has **`Read/Write`** privileges to the network-attached storage path

- `Archive Directory Format` – Users can choose from the following directory layouts:

  - `Flat` – Received images are stored under current-date based (**YYYY-MM-DD-WEEKDAY**/) sub-folders under the assigned archive directory. For example, if today is January 15, 2006, then all images received today are stored under **`$AssignedDirectory/2006-01-15-SUN/`**.
  - `Hierarchical` – Received images are stored under current-date based (**YYYY/MM/DD**/) sub-folders under the assigned archive directory. For example, if today is January 15, 2006, then all images received today are stored under **`$AssignedDirectory/2006/01/15/`**.
  - `Study UID` – Received images are stored under the Dicom Study Instance UID sub-folders under the assigned archive directory. For example, if the Study Instance UID of the received Dicom study is "`1.2.840.113674.514.212.200`", then all images of that study will be stored under **`$AssignedDirectory/ 1.2.840.113674.514.212.200/`**.

- `Long-Term Archive Directory` – Long-Term Archive directory for this AE. See the **Automatic Aging** option below.
- `Automatically Age From Short-Term Archive Directory To Long-Term Archive Directory` – If this option is enabled, and the **`Long-Term Archive Directory`** above is defined, then PacsOne will automatically age images stored in the Short-Term Archive Directory to the defined Long-Term Archive Directory, by moving all images stored under the Short-Term Archive Directory that were received prior to the user-defined **Aging Period** (in days) to the defined Long-Term Archive Directory.
- `Date/Time Schedule for Automatic Aging` – Weekly date/time schedule to perform the Automatic Aging from short-term to long-term archive directories. For example, every Sunday at 12:00 am, etc.
- `Directory Usage` – Current disk space usage of the Archive Directory if this AE is a C-STORE SCU
- `Send Email Notifications When New Study From this AE is received` – If this feature is enabled, and a new Dicom study is received from this AE with the Referring Physician's Name matching

with one of the web user's first and last names, PacsOne Server will send a notification email to that user's email address (if defined) about the newly received study.

- `Compress images received from this AE` – If a Dicom compression transfer syntax is defined for this AE, PacsOne Server will automatically compress any uncompressed Dicom images received from this AE using the defined Dicom compression transfer syntax, so that the compressed Dicom images can be delivered to the web viewers than the uncompressed images (Please see Section 15 for more details about this feature).
- `Anonymize studies received from this AE` – If this option is enabled, PacsOne Server will anonymize studies received from this source AE by the syntax rules pre-defined in a template selected by the user (Please see Section 13.14.14 for more details about this feature).
- `Assign Dicom Studies Received From This AE To Web Users` – The Administrator can enable this option and assign one or more web users to a Source AE defined in the **Application Entity** table, so that the web users assigned to this Source AE can access all Dicom studies received from this Source AE, even if the assigned web users do not have the '**View**' privilege to access private studies, or their registered last and first names do not match with either the **Referring Physician's Name** or the **Reading Physician's Name** of the received Dicom study.
- `Use Transcription Template for Dicom Studies Received from this AE` – If this option is enabled, PacsOne Server will assign the selected transcription template for any Dicom study received from this source AE, so that the web users can download the Microsoft Word document template with the pre-configured bookmarks automatically filled-in with information from that Dicom study. (Please see Section 13.14.15 for more details about this feature).

10.2 SCP Application Entities

In addition to the columns common to the Application Entity table, i.e., AE Title, Hostname, IP Address, the following SCU specific values will be displayed in the `Application Entity Table` page if the AE is a SCP:

- `Verify Connection` – Clicking on the **`Ping`** link will verify if the remote SCP can accept DICOM association requests by sending a C-ECHO request to the specified TCP port number. If the C-ECHO is accepted successfully, a pop-up message box will be displayed to indicate confirmation for the C-ECHO request. Otherwise, an error page will follow with any possible source or reason for the failure.
- `Remote Exams` – Clicking on the **`Query/Retrieve`** link will display the `Search Remote PACS Database` page as illustrated below:

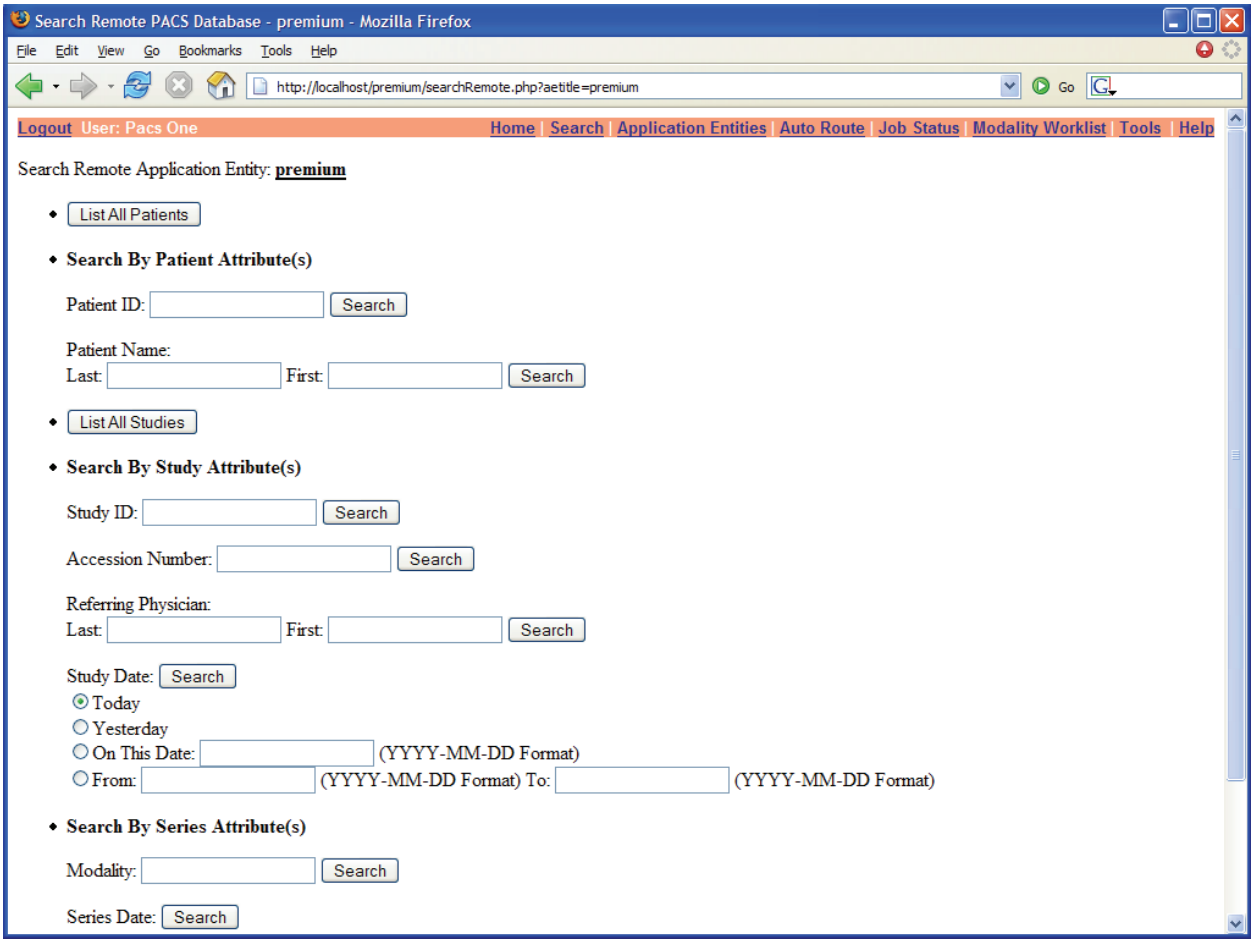
Search Remote PACS Database - premium - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/premium/searchRemote.php?aetitle=premium
Go
Logout User: Pacs One
Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Search Remote Application Entity: premium
List All Patients
Search By Patient Attribute(s)
Patient ID: Search
Patient Name:
Last: First: Search
List All Studies
Search By Study Attribute(s)
Study ID: Search
Accession Number: Search
Referring Physician:
Last: First: Search
Study Date: Search
Today
Yesterday
On This Date: (YYYY-MM-DD Format)
From: (YYYY-MM-DD Format) To: (YYYY-MM-DD Format)
Search By Series Attribute(s)
Modality: Search
Series Date: Search

Figure 10 Search Remote PACS Database

Where you can search by using the following criteria:

- `List All Patients` – Selecting this option will send a Patient-Root Information Model C-FIND request with **`Universal Matching`** for the `Patient ID` attribute to the remote Query/Retrieve SCP.
- `Search By Patient Attributes` – You can search either by `Patient ID` or `Patient Name` attribute, wild-card characters '**`*`**' (one or more characters) and '**`?`**' (Any single character) are supported. If wild-card characters are used, then a C-FIND request with **`Wild-Card Matching`** for either the `Patient ID` or `Patient Name` attribute will be sent to the remote Query/Retrieve SCP. Otherwise**,** **`Single Value Matching`** will be used instead.
- `List All Studies` – Selecting this option will send a Study-Root Informational Model C-FIND request with **`Universal Matching`** for the `Study UID` attribute to the remote Query/Retrieve SCP.
- `Search By Study Attributes` – You can search by `Study ID`, `Accession Number`, `Referring Physician's Name` or `Study Date`. Wild-Card characters are supported for searching by `Study ID`, `Accession Number` or `Referring Physician's Name`. **`Wild-Card Matching`** will be used in the C-FIND request if wild-card characters are used when searching for `Study ID`, `Accession Number` or `Referring Physician's Name`, **`Single Value Matching`** will be used otherwise. **`Single Value Matching`** will be used when searching by `Study Date` for Today, Yesterday or a particular fixed date; **`Range Matching`** will be used otherwise when searching by `Study Date`.
- `Search By Series Attributes` – You can search by `Modality` or `Series Date`. Wild-Card characters are supported for searching by `Modality`. **`Wild-Card Matching`** will be used in the C-

FIND request if wild-card characters are used when searching for `Modality`, **`Single Value Matching`** will be used otherwise. **`Single Value Matching`** will be used when searching by `Series Date` for Today, Yesterday or a particular fixed date; **`Range Matching`** will be used otherwise when searching by `Series Date`.

- `Modality Worklist` – Clicking on the **`Get Worklist`** link will initiate a DICOM Worklist-FIND command to the remote Worklist SCP and display any worklist item(s) retrieved from the remote AE.
- `Printer Properties` – Clicking on the **`Printer Properties`** link will initiate a DICOM N-GET command to the remote Dicom printer and retrieve the properties and current status information of the remote printer.

10.2.1 Modality Worklist SCP Application Entities:

If the '***WorklistScp***' attribute is set to '***True***' for a specified AE in the Application Entity table, PacsOne Server will poll the corresponding Worklist SCP periodically to retrieve worklist items using a pre-defined interval. The default polling interval is 10 minutes, and this interval is configurable by modifying the following Windows Registry value:

```
HKEY_LOCAL_MACHINE\Software\Rainbowfish Software\PacsOne\{AETITLE}\WorklistPollInterval
```

Where:

{AETITLE*}* is the Application Entity Title you have assigned for PacsOne Server during installation.

Additionally, if PacsOne Server receives DICOM N-EVENT-REPORT **Study Scheduled** event notifications from remote Detached Study Management SCP applications, PacsOne will query any defined Modality Worklist SCP application entity (s) for the relevant study information contained in the **Study Scheduled** event report notification.

By default, PacsOne Server queries the remote Worklist SCP with the **Scheduled Procedure Start Date** filter of **Today's Date**, i.e., PacsOne will query the remote Worklist SCP for all procedures that are scheduled to start today or later. If you want PacsOne to also query for procedures scheduled for the last N days as well, you can add or set the following Windows Registry value:

```
HKEY_LOCAL_MACHINE\Software\Rainbowfish Software\PacsOne\{AETITLE}\ WorklistPollPeriod
```

Where:

{AETITLE*}* is the Application Entity Title you have assigned for PacsOne Server during installation.

Set the DWORD value to N if you want PacsOne to include the procedures scheduled in the last N days when it queries the remote Worklist SCP. If you want PacsOne to query for all scheduled worklist data from the remote Worklist SCP, you can set this DWORD value to `0xFFFFFFFF` (-1).

10.2.1.1 Pre-Fetching of Dicom Studies for Scheduled AE Station

When PacsOne Server retrieves worklist information for a scheduled patient, and the scheduled AE station is defined in the Application Entity table of PacsOne Server, then PacsOne will automatically push any pre-existing studies of this patient of the same modality information to the scheduled AE station, so that the scheduled AE station won't have to fetch them manually from PacsOne if it wants to access prior studies of the scheduled patient.
This Pre-Fetching feature is enabled by default. To disable it, the following Registry DWORD value must be defined:

```
HKEY_LOCAL_MACHINE\Software\Rainbowfish Software\PacsOne\{AETITLE}\PrefetchStudiesFromWorklist
```

Where:

{AETITLE} is the Application Entity Title you have assigned for PacsOne Server during installation. The above DWORD value must be explicitly set to 0 in order to disable the Pre-Fetching feature.

10.2.2 Query/Retrieve SCP Application Entities:

If the '***Query/Retrieve Scp***' attribute is set to '***True***' for a specified AE in the Application Entity table, users can optionally enable the Remote Study Synchronization feature by choosing from one of the following option boxes:

- `Do Not Synchronize Remote Studies` – This feature will be disabled.
- `Synchronize Remote Studies On the Following 24 Hour Schedule` – Users can choose up to 24 hourly schedules for PacsOne Server to synchronize remote studies stored on this remote AE. Users can further choose from the following synchronization methods:
  - `Synchronize All Remote Studies` – PacsOne Server will query (**`C-FIND`**) this remote AE and find all studies that are not currently in the local PacsOne Serve database, PacsOne Server will then fetch (**`C-MOVE`**) those studies from this remote AE.
  - `Synchronize Remote Studies Received within the Last [N] Days` – PacsOne Server will query (**`C-FIND`**) this remote AE and find all studies that were recently received within the last N days, PacsOne Server will then fetch (**`C-MOVE`**) those studies from this remote AE.
  - `Update Existing Studies If Already Exist` – If this checkbox is selected, PacsOne Server will retrieve studies stored in this remote AE, even if they already exist in the current PacsOne Server database.

  Users can visit the '**`Job Status`**' page to check the status of these scheduled remote synchronizations on a daily basis.
- `Mark Retrieved Studies as Read` – If this feature is enabled, PacsOne Server will mark a study as **Read** after it has been retrieved or moved to this destination AE.
- `Job Queue Priority` – This is the priority when processing database jobs for this destination AE. The default value is 0 which means **Normal** priority. Database jobs with higher priority destination AEs will be processed before those jobs with lower priority destination AEs.

10.2.3 AE Group Settings:

If an Application Entity (AE) is configured as an AE Group with one or more application entities as members, then this group AE can be used as a round-robin distribution group when it's configured as the Destination AE for an automatic routing rule with the "**`Wait N Minutes and Forward the Entire Study`**" option enabled. For example, if an AE group consists of 3 individual member AEs: `AE#1`, `AE#2` and `AE#3` and this AE group is configured as the Destination AE for an automatic routing rule with the "**`Wait N Minutes and Forward the Entire Study`**" option enabled, then the 1st matching study received will be forwarded to `AE#1`, the 2nd matching study received will be forwarded to `AE#2`, the 3rd matching study received will be forwarded to `AE#3`, the 4th matching to `AE#1`, the 5th to `AE#2`, the 6th to `AE#3`, etc. So in summary, the AE group serves as the round-robin distribution method to forward matching studies received to all member AEs.

11 HL7 Applications (optional)

This page will be displayed if the optional HL7 Message Listener module is installed along with PacsOne Server Premium Edition, where the users can add, modify or delete defined HL7 applications:

- `Application Name` - Name of this HL7 application. This name is used as the key to the HL7 Application table, so multiple HL7 applications cannot share the same name.
- `Facility` - Facility of this HL7 application.
- `Description` - Description of this HL7 application.
- `Hostname` - Name of the host where this HL7 application is running.
- `IP Address` - If DNS hostname is not configured above, then a static or dynamic IP address can be configured here.
- `Port Number` - TCP port this HL7 application listens to for incoming connections.
- `Maximum Number of Simultaneous Connections` - The maximum number of simultaneous connections that PacsOne Server will establish with this HL7 application at any time. Default value is 10.
- `Enable ORU Report Notification Message for Newly Received Dicom Studies` - If this option is enabled, PacsOne Server will send a HL7 ORU message to this HL7 application with the URL for accessing newly received Dicom studies when they are received for the very first time.

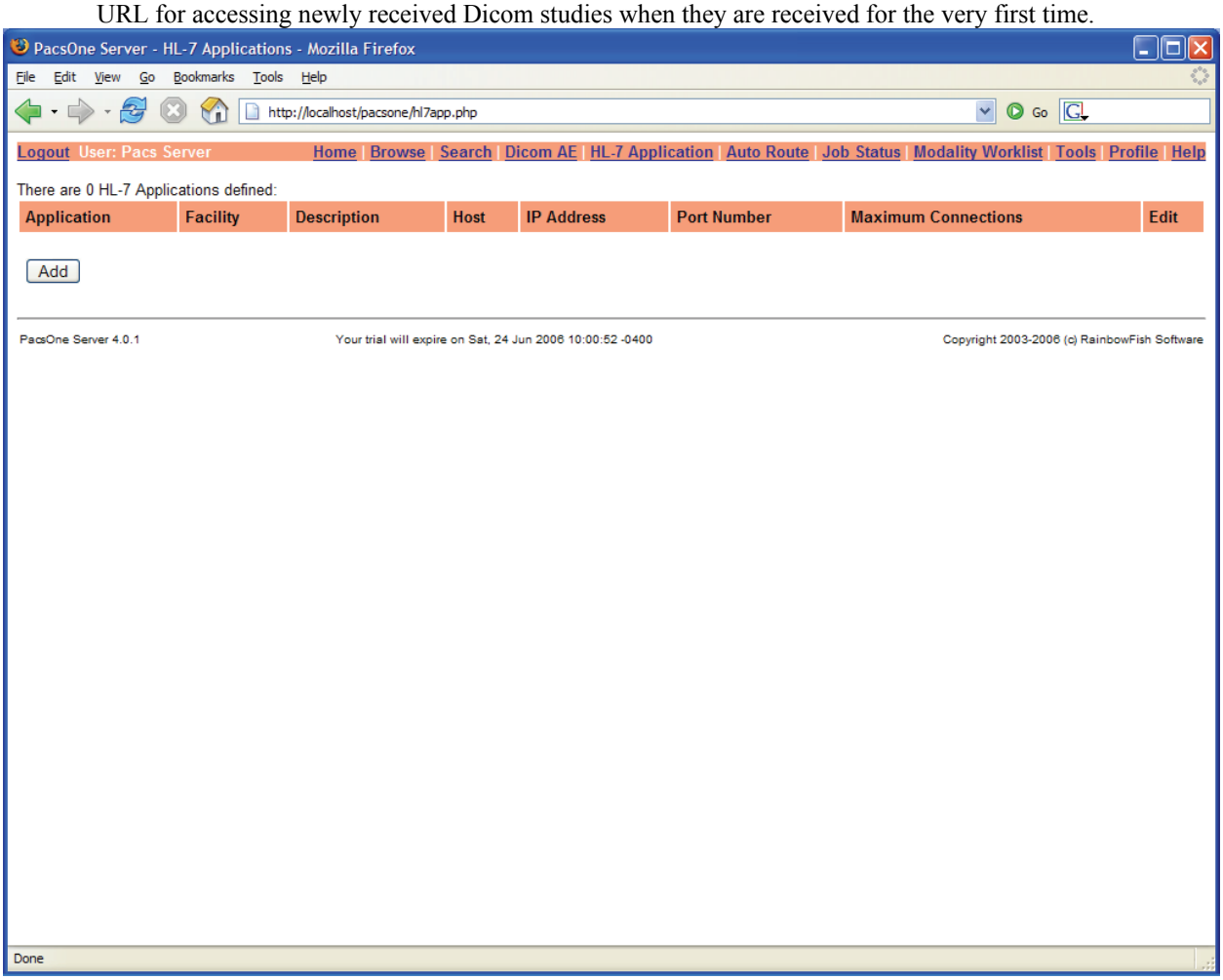
PacsOne Server - HL-7 Applications - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/hl7app.php
Go
Logout User: Pacs Server
Home | Browse | Search | Dicom AE | HL-7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
There are 0 HL-7 Applications defined:
Application
Facility
Description
Host
IP Address
Port Number
Maximum Connections
Edit
Add
PacsOne Server 4.0.1
Your trial will expire on Sat, 24 Jun 2006 10:00:52 -0400
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 11 HL7 Applications (optional)

12 Searching PacsOne Database

Clicking on the '**`Search`**' link from the `Main Menu` bar will display the '`Search Local PacsOne Database`' page, which is similar to the '`Search Remote PACS Database`' page above, where users can search by patient, study, series or image attributes.

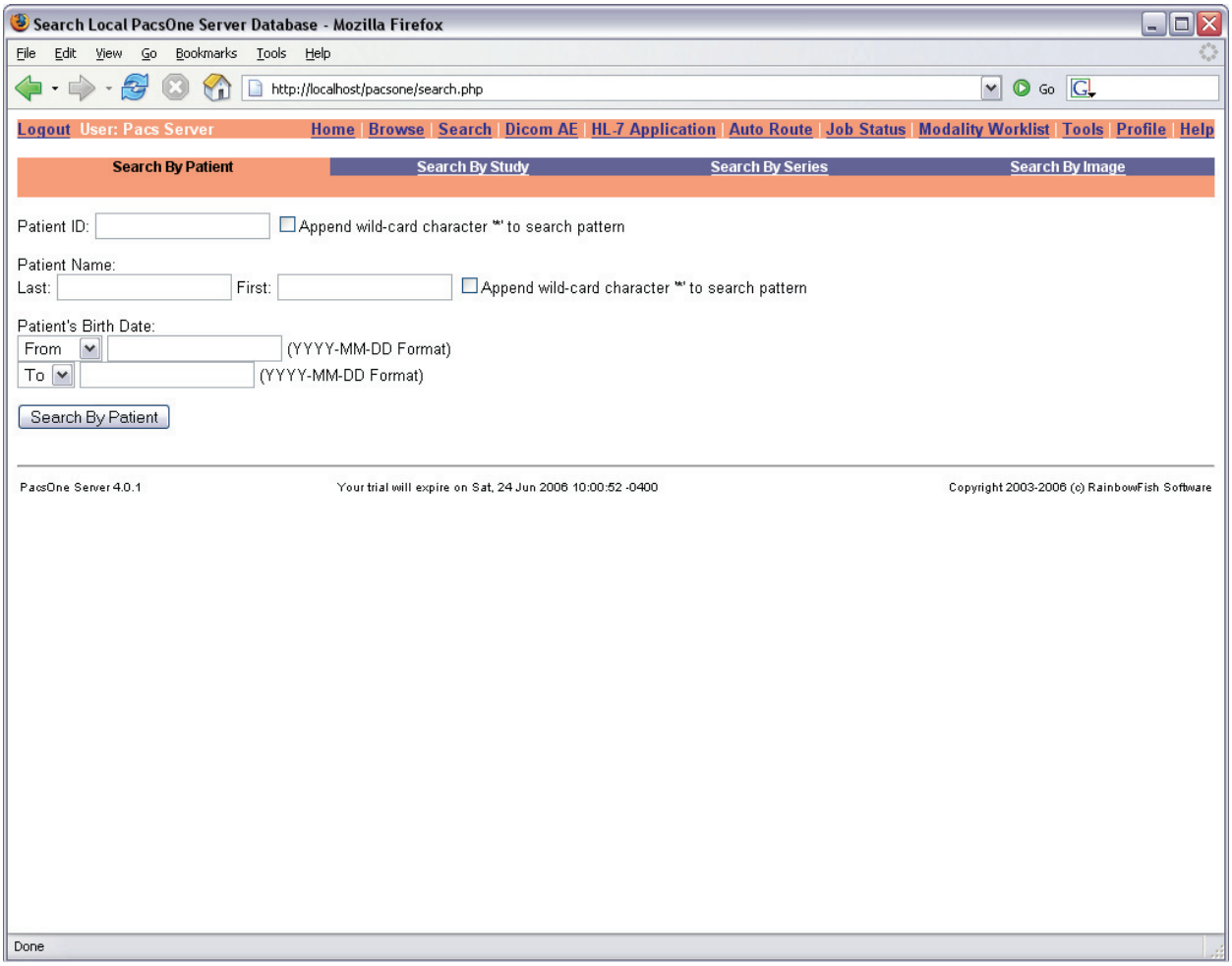
Search Local PacsOne Server Database - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/search.php
Go
Logout User: Pacs Server
Home | Browse | Search | Dicom AE | HL-7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Search By Patient
Search By Study
Search By Series
Search By Image
Patient ID:
Append wild-card character '*' to search pattern
Patient Name:
Last:
First:
Append wild-card character '*' to search pattern
Patient's Birth Date:
From
(YYYY-MM-DD Format)
To
(YYYY-MM-DD Format)
Search By Patient
PacsOne Server 4.0.1
Your trial will expire on Sat, 24 Jun 2006 10:00:52 -0400
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 12 Search PacsOne Server Database

13 Navigating PacsOne Web User Interface

After a PacsOne user account has been created successfully by the Administrator/Super-user ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) in Section 6.2, the user can access the PacsOne web user interface from any web browser, by logging into PacsOne from the URL below:

http://{HOSTNAME}/pacsone/home.php

NOTE: {HOSTNAME} is the name of the machine where PacsOne is installed.

13.1 Login Page

Before any of the PacsOne web user interface pages can be accessed, the user needs to be authenticated through the Login Page below, where a valid MySQL username and password must be specified:

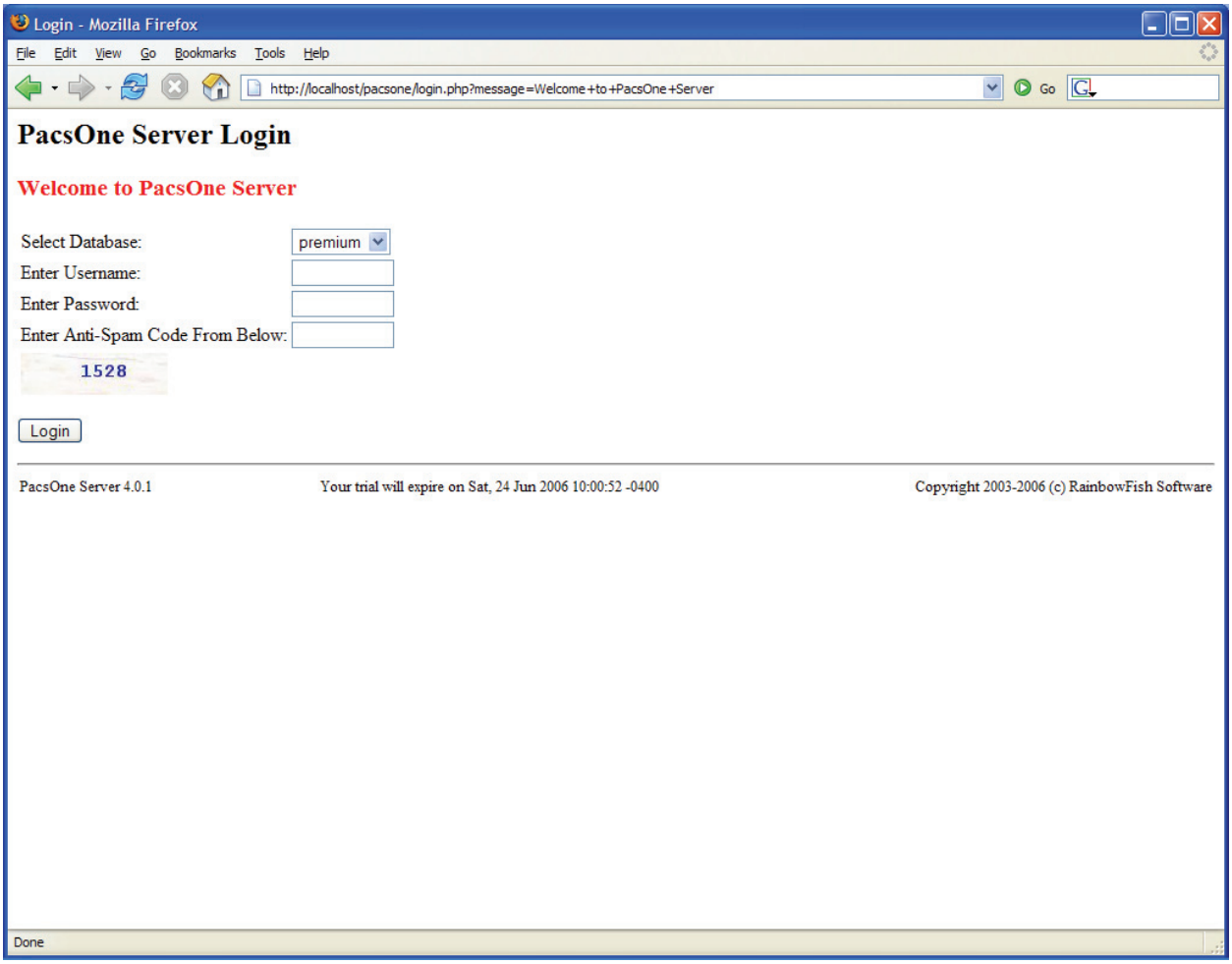

Figure 13 Login Page

13.2 Home Page (Today's Study Page)

After the user has been authenticated by the Login Page, the Home Page will be displayed below which contains a list of accessible studies received today:

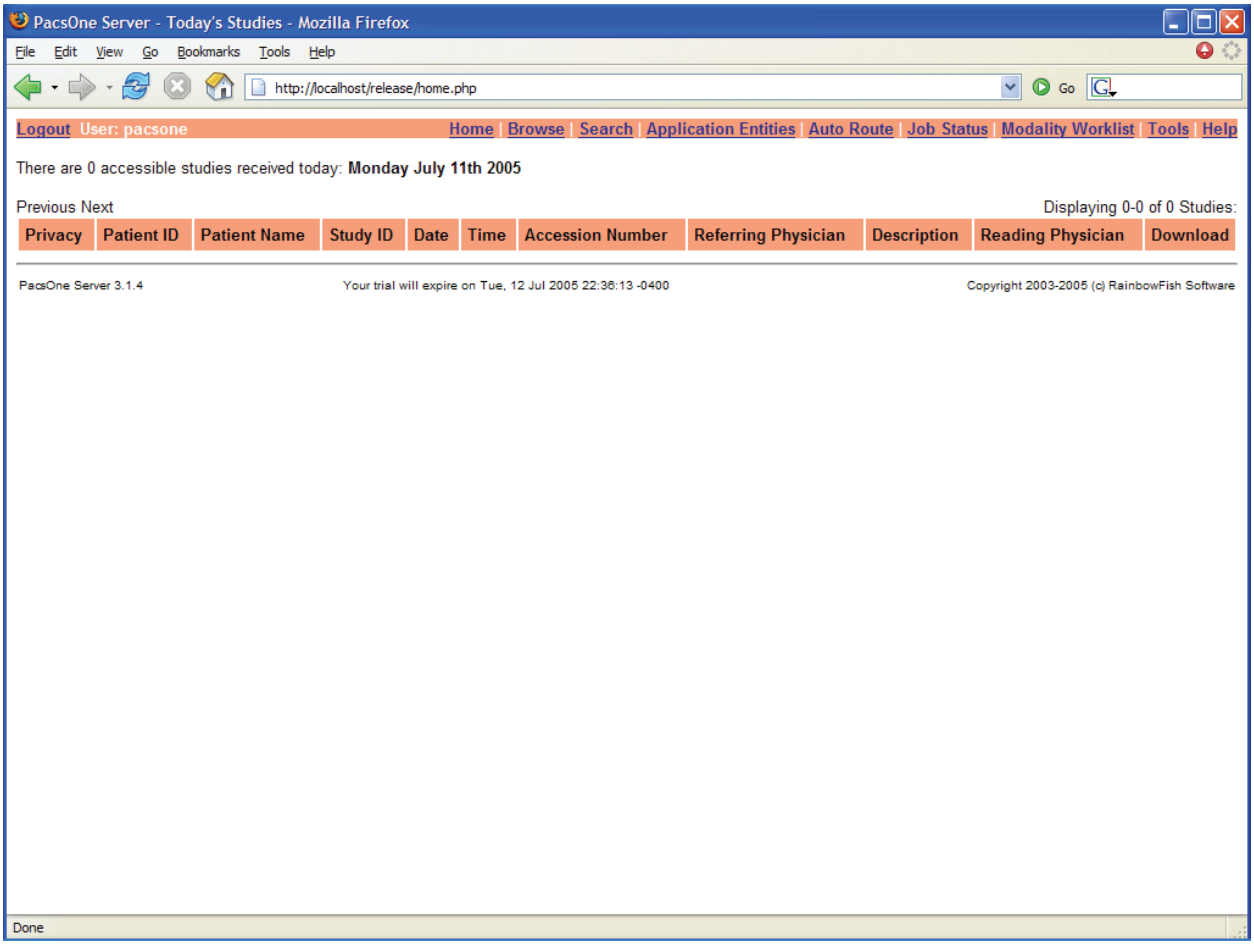
PacsOne Server - Today's Studies - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/release/home.php
Go
Logout User: pacsone
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
There are 0 accessible studies received today: Monday July 11th 2005
Previous Next
Displaying 0-0 of 0 Studies:
Privacy
Patient ID
Patient Name
Study ID
Date
Time
Accession Number
Referring Physician
Description
Reading Physician
Download
PacsOne Server 3.1.4
Your trial will expire on Tue, 12 Jul 2005 22:36:13 -0400
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 14 Home Page (Today's Study Page)

13.3 Main Menu Bar

This navigation menu bar is displayed at the top of every PacsOne user interface, with the left side displaying the current logged-in user and right side displaying the following navigational links:

- `User Administration` – This link is displayed only if the current user is the Administrator/Super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases), clicking on this page will display the main `User Administration` page described in Section 6 above.
- `Configuration` – This link is displayed only if the current user is the Administrator/Super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases), clicking on this page will display the main `System Configuration` page described in Section 7 above.
- `Email` – This link is displayed only if the current user is the Administrator/Super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases), clicking on this page will display the main `SMTP Server Configuration` page described in Section 8 above.
- `Journal` – This link is displayed only if the current user is the Administrator/Super-user ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases), clicking on this page will display the main `System Journal Log` page described in Section 9 above.
- `Home` – Clicking on this link will display the `Today's Study` page described in Section 13.2 above.
- `Browse` – Clicking on this link will display a list of all accessible patients in the database. See Section 13.4 below.

- `Search` – Clicking on this link will display the Search Local PacsOne Server Database page described in Section 12 - Searching PacsOne Database above.
- `Dicom AE` – Clicking on this link will display the `Application Entity Table` page described in Section 10 above.
- `HL7 Applications (optional)` – Clicking on this link will display the `HL7 Application Table` page described in Section 11 above.
- `Auto Route` – Clicking on this link will display the `Automatic Routing` page described in Section 15 below.
- `Job Status` – Clicking on this link will display the current scheduled database job status for the current user, which is described in Section 17 below.
- `Modality Worklist` – Clicking on this link will display the `Modality Worklist Table` described in Section 10.2 above.
- `Tools` – Clicking on this link will display the `Tools` page described in Section 13.13 above.
- `Profile` – Clicking on this link will display the `User Profile` page described in Section 13.14 above.
- `Help` – Clicking on this link will display this document.
- `Logout` – Clicking on this link will logout current user and go back to the PacsOne `Login` page.

13.4 Unread Studies Page

This page displays the current list of unread studies in the PacsOne Server database. Note that studies displayed in this page are high-lighted with the **Un-read** color background.

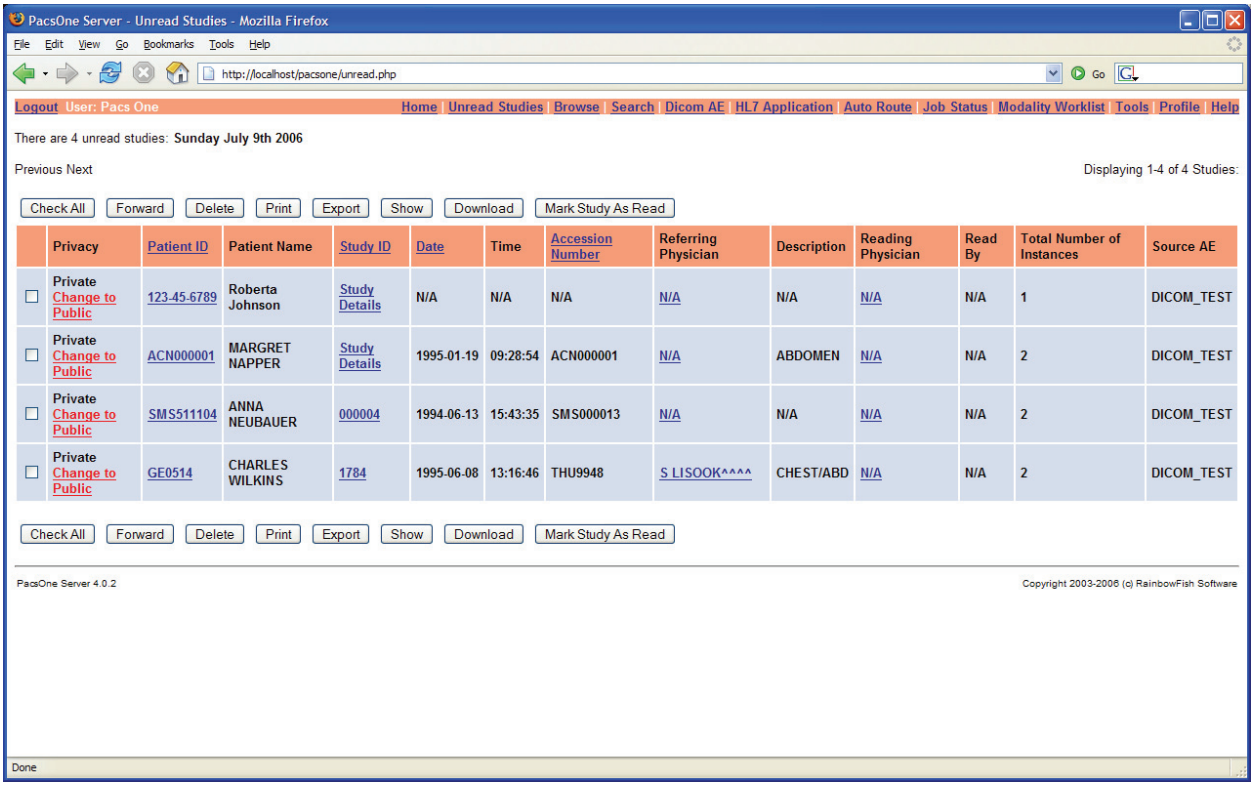
PacsOne Server - Unread Studies - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/unread.php
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
There are 4 unread studies: Sunday July 9th 2006
Previous Next
Displaying 1-4 of 4 Studies:
Check All | Forward | Delete | Print | Export | Show | Download | Mark Study As Read
Privacy | Patient ID | Patient Name | Study ID | Date | Time | Accession Number | Referring Physician | Description | Reading Physician | Read By | Total Number of Instances | Source AE
Private Change to Public | 123-45-6789 | Roberta Johnson | Study Details | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1 | DICOM_TEST
Private Change to Public | ACN000001 | MARGRET NAPPER | Study Details | 1995-01-19 | 09:28:54 | ACN000001 | N/A | ABDOMEN | N/A | N/A | 2 | DICOM_TEST
Private Change to Public | SMS511104 | ANNA NEUBAUER | 000004 | 1994-06-13 | 15:43:35 | SMS000013 | N/A | N/A | N/A | N/A | 2 | DICOM_TEST
Private Change to Public | GE0514 | CHARLES WILKINS | 1784 | 1995-06-08 | 13:16:46 | THU9948 | S LISOOK^^^^ | CHEST/ABD | N/A | N/A | 2 | DICOM_TEST
Check All | Forward | Delete | Print | Export | Show | Download | Mark Study As Read
PacsOne Server 4.0.2
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 15 Unread Studies Page

13.5 Browse Page

This page displays a list of accessible patients for the current user, with the following patient-specific information depending on the privilege level of the current user:

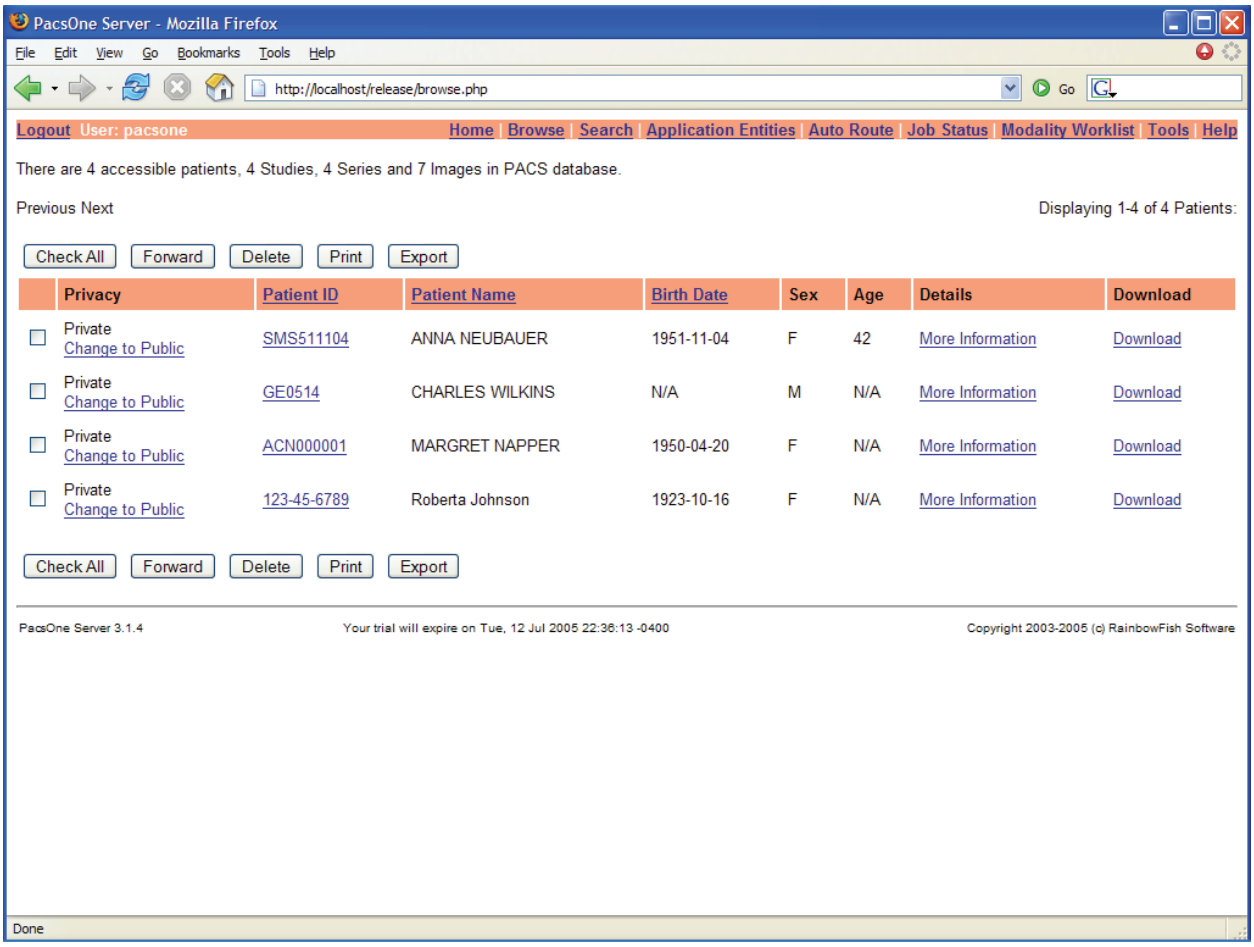
PacsOne Server - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/release/browse.php
Go
Logout User: pacsone
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
There are 4 accessible patients, 4 Studies, 4 Series and 7 Images in PACS database.
Previous Next
Displaying 1-4 of 4 Patients:
Check All Forward Delete Print Export
Privacy | Patient ID | Patient Name | Birth Date | Sex | Age | Details | Download
Private Change to Public | SMS511104 | ANNA NEUBAUER | 1951-11-04 | F | 42 | More Information | Download
Private Change to Public | GE0514 | CHARLES WILKINS | N/A | M | N/A | More Information | Download
Private Change to Public | ACN000001 | MARGRET NAPPER | 1950-04-20 | F | N/A | More Information | Download
Private Change to Public | 123-45-6789 | Roberta Johnson | 1923-10-16 | F | N/A | More Information | Download
Check All Forward Delete Print Export
PacsOne Server 3.1.4
Your trial will expire on Tue, 12 Jul 2005 22:36:13 -0400
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 16 Browse Page

- `Public/Private` – This is the privacy attribute of the patient (s). This column is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the '`Change to Public`' or '`Change to Private`' will toggle the privacy setting for the patient.
- `PatientID` – Patient ID. Clicking on this link will display the `Study` page described below in Section 13.6, for all studies belong to this patient.
- `PatientName` – Name of the patient.
- `BirthDate` – Patient's Birth Date.
- `Sex` – Patient's sex.
- `Age` – Patient's age.
- `Details` – Clicking on the '`Display`' link will display further detailed information about this patient.
- `Download` – This link is '`Enabled`' only if the current user has the '**`Download`**' privilege is '`Enabled`'. Clicking on this link will download all images of this patient compressed into a ZIP file to the web browser.
- `Check All/Uncheck All` – This button is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the 'Check All' or 'Uncheck All' button toggles between selecting all patients and un-selecting all patients.
- `Forward` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will display the '`Forward Images`' page, which is described in Section 14 below for forwarding all images of the selected patient (s) to a remote SCP.

- `Delete` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will pop-up a message box asking for confirmation to delete the selected patient (s) from the PacsOne Server database. If confirmed, the selected patient (s) will be removed from the PacsOne database.
- `Print` – This button is displayed only if the current user has the '**`Print`**' privilege is '`Enabled`'. Clicking on this button will print the selected patients to the destination printer and printing format selected by the user.
- `Export` – This button is displayed only if the current user has the '**`Export`**' privilege is '`Enabled`'. Clicking on this button will export the selected patients into a destination folder specified by the user, using the Dicom standard Part 10 directory format (**`DICOMDIR`**) for media interchange.

13.6 Study Page

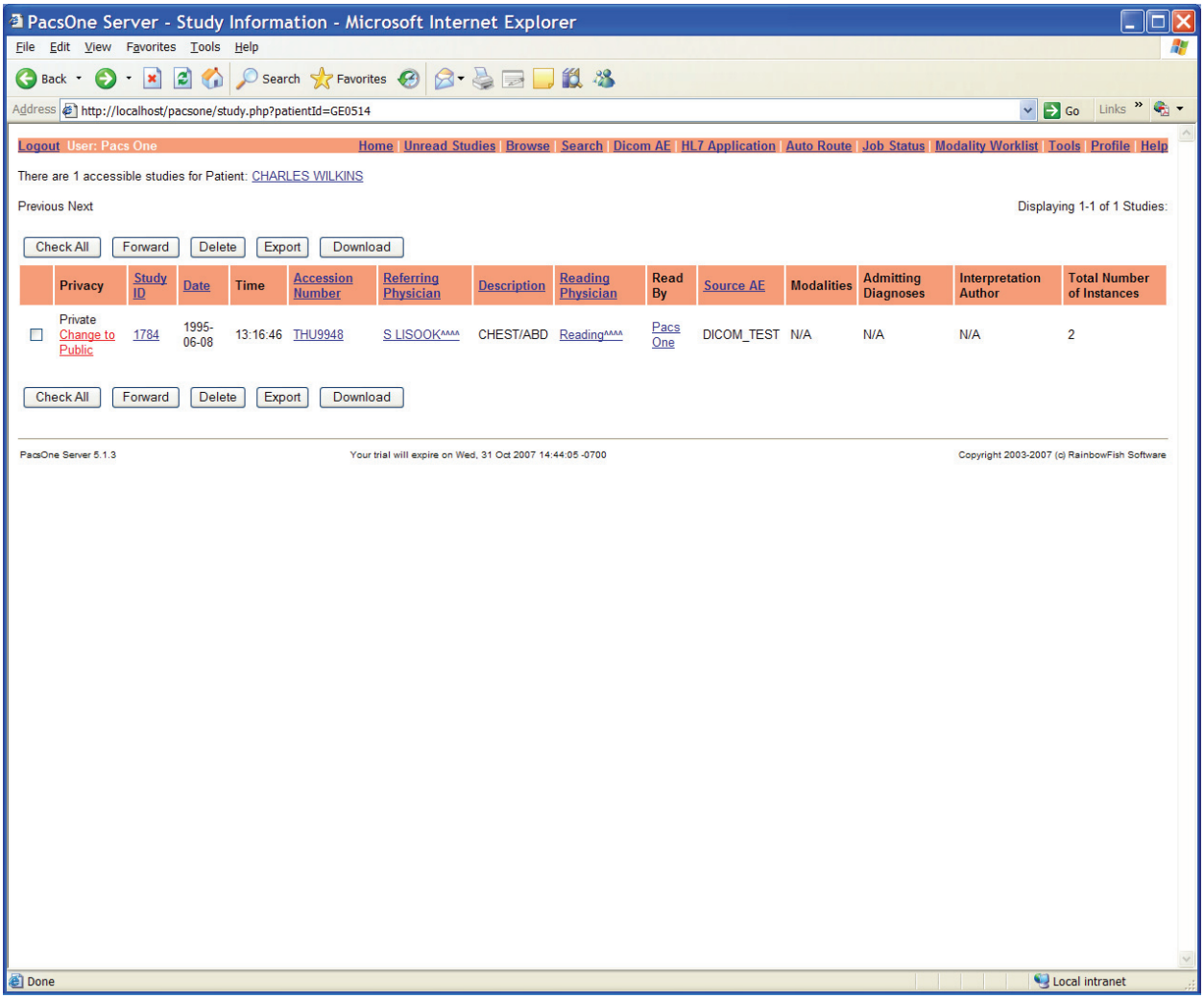

Figure 17 Study Page

This page displays a list of accessible studies of a patient for the current user, with the following study-specific information depending on the privilege level of the current user:

- `Public/Private` – This is the privacy attribute of the study (s). This column is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the '`Change to Public`' or '`Change to Private`' will toggle the privacy setting for the study.

- `ID` – Study ID. Clicking on this link will display the `Series` page described below in Section 13.7, for all series belong to this patient.
- `Date` – Study date.
- `Time` – Study time.
- `Accession Number` – Accession Number.
- `Modalities` – A list of modalities in the study.
- `Referring Physician` – Name of the referring physician.
- `Description` – Study description.
- `Reading Physician` – Name of physician reading the study.
- `Admitting Diagnoses` – Admitting diagnoses.
- `Interpretation Author` – Name of the interpretation author.
- `Download` – This link is '`Enabled`' only if the current user has the '**`Download`**' privilege is '`Enabled`'. Clicking on this link will download all images of this study compressed into a ZIP file to the web browser.
- `Check All/Uncheck All` – This button is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the '**`Check All`**' or '**`Uncheck All`**' button toggles between selecting all studies and un-selecting all studies.
- `Forward` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will display the '`Forward Images`' page, which is described in Section 10 below for forwarding all images of the selected study (s) to a remote SCP.
- `Delete` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will pop-up a message box asking for confirmation to delete the selected study (s) from PacsOne database. If confirmed, the selected patient (s) will be removed from the PacsOne database.
- `Print` – This button is displayed only if the current user has the '**`Print`**' privilege is '`Enabled`'. Clicking on this button will print the selected studies to the destination printer and printing format selected by the user.
- `Export` – This button is displayed only if the current user has the '**`Export`**' privilege is '`Enabled`'. Clicking on this button will export the selected studies into a destination folder specified by the user, using the Dicom standard Part 10 directory format (**`DICOMDIR`**) for media interchange.

13.7 Series Page

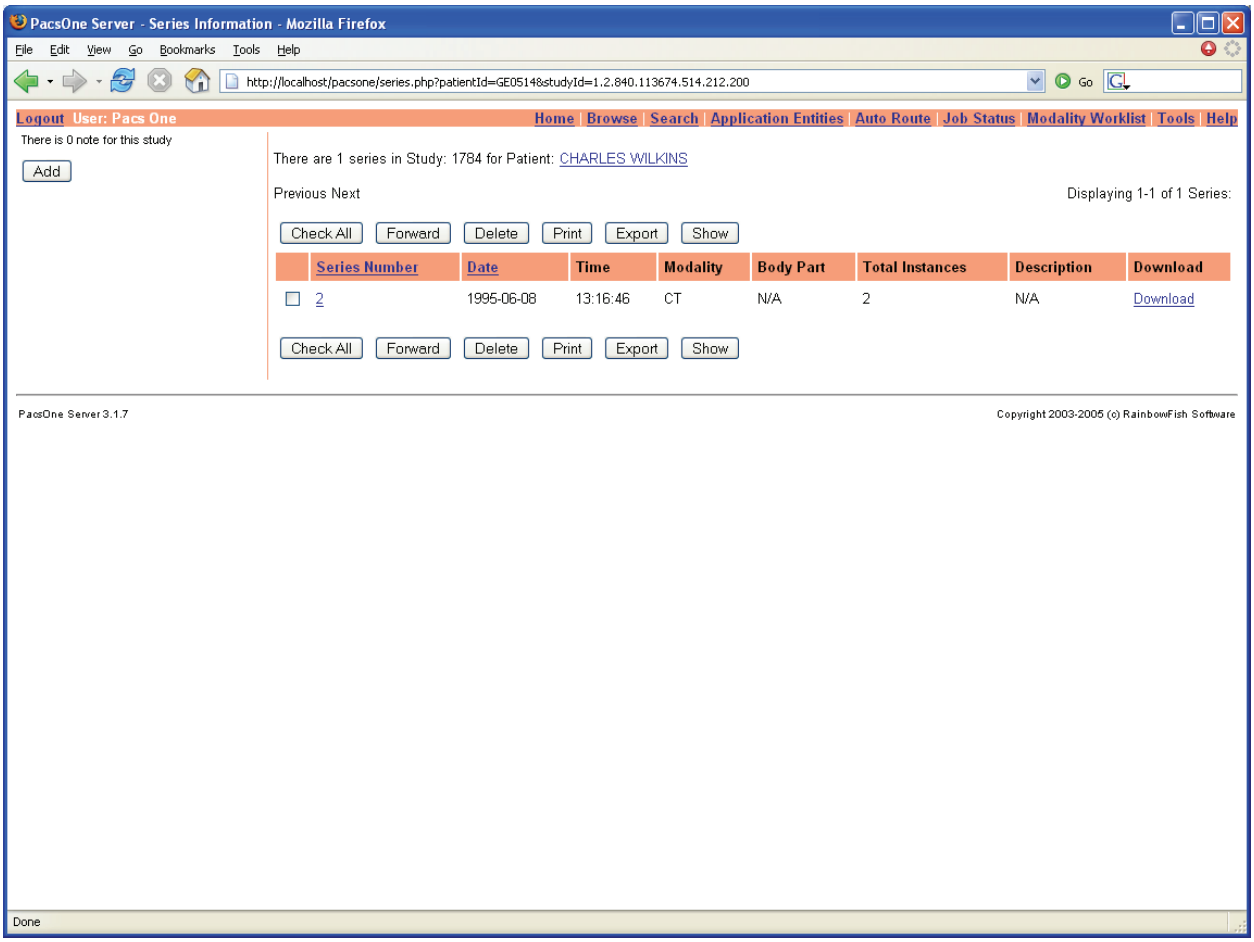
PacsOne Server - Series Information - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/series.php?patientId=GE0514&studyId=1.2.840.113674.514.212.200
Logout User: Pacs One
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
There is 0 note for this study
Add
There are 1 series in Study: 1784 for Patient: CHARLES WILKINS
Previous Next
Displaying 1-1 of 1 Series:
Check All Forward Delete Print Export Show
Series Number Date Time Modality Body Part Total Instances Description Download
2 1995-06-08 13:16:46 CT N/A 2 N/A Download
Check All Forward Delete Print Export Show
PacsOne Server 3.1.7
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 18 Series Page

This page displays a list of series of the selected study for the current user, with the following series-specific information depending on the privilege level of the current user:

- `Series Number` – Series Number. Clicking on this link will display the `Image` page described below in Section 13.10, for all images belong to this series.
- `Date` – Series date.
- `Time` – Series time.
- `Modality` – Modality of the series.
- `Body Part` – Body part.
- `Total Instances` – Total number of images in this series.
- `Description` – Series description.
- `Download` – This link is '`Enabled`' only if the current user has the '**`Download`**' privilege is '`Enabled`'. Clicking on this link will download all images of this series compressed into a ZIP file to the web browser.
- `Check All/Uncheck All` – This button is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the '**`Check All`**' or '**`Uncheck All`**' button toggles between selecting all series and un-selecting all series.
- `Forward` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will display the '`Forward Images`' page, which is described in Section 14 below for forwarding all images of the selected series to a remote SCP.

- `Delete` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will pop-up a message box asking for confirmation to delete the selected series from PacsOne database. If confirmed, the selected series will be removed from the PacsOne database.
- `Print` – This button is displayed only if the current user has the '**`Print`**' privilege is '`Enabled`'. Clicking on this button will print the selected series to the destination printer and printing format selected by the user.
- `Export` – This button is displayed only if the current user has the '**`Export`**' privilege is '`Enabled`'. Clicking on this button will export the selected series into a destination folder specified by the user, using the Dicom standard Part 10 directory format (**`DICOMDIR`**) for media interchange.

This page also displays a list of user notes about the subject study on the Left Panel, where the logged-in user can add discussion notes about this study by clicking on the '**`Add`**' button.

13.8 Study Notes Page

This page is used for registered users to exchange discussion notes about a subject study. Users can add, modify or delete notes with a subject headline and detailed text notes as bulletin-board style discussions about the subject study. Users with '**`Upload`**' privilege can also upload text files, zip files, PDF/Word documents, as well as audio/video clips as attachments to the related study notes.

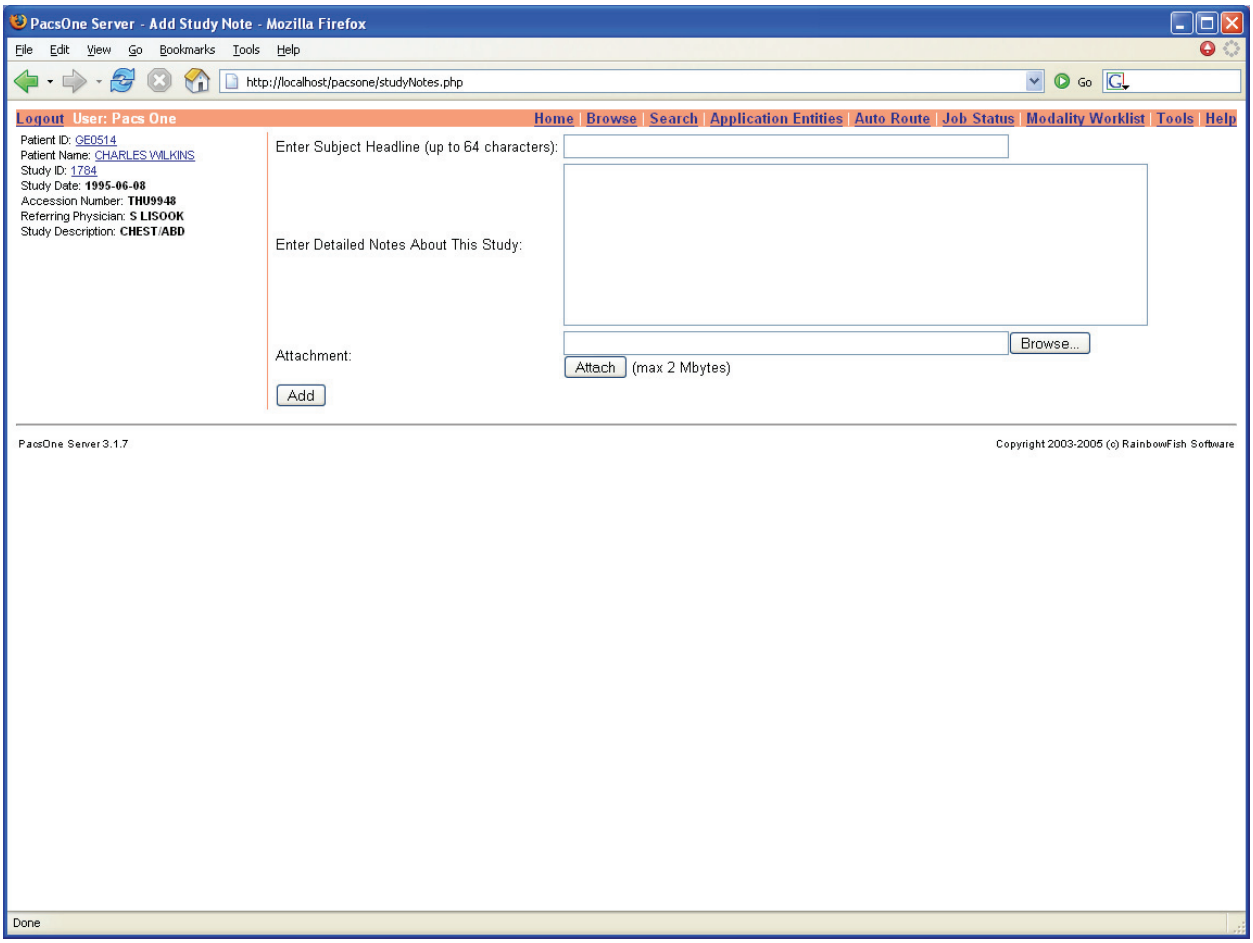
PacsOne Server - Add Study Note - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/studyNotes.php
Logout User: Pacs One
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Patient ID: GE0514
Patient Name: CHARLES WILKINS
Study ID: 1784
Study Date: 1995-06-08
Accession Number: THU9948
Referring Physician: S LISOOK
Study Description: CHEST/ABD
Enter Subject Headline (up to 64 characters):
Enter Detailed Notes About This Study:
Attachment:
Browse...
Attach (max 2 Mbytes)
Add
PacsOne Server 3.1.7
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 19 Add Study Notes

From the "`Add Study Notes`" page above, users can enter discussion notes about this study, and each note consists of the following information:

- `Subject Headline` – Any text of up to 64 characters
- `Details Notes` – Any text of up to 512 characters
- `Attachments` – If the logged-in user has the '**`Upload`**' privilege enabled, users can upload additional files such as text files, PDF/Word documents, zip files, audio/video clips, etc. of maximum file size allowed for file uploads. This limit is controlled by the smaller value of the following two variable:
    - **`$MAX_UPLOAD_LIMIT`** system configuration variable described in Section 7 - System Configuration
    - **`upload_max_filesize`** variable in your '**`PHP.INI`**' file

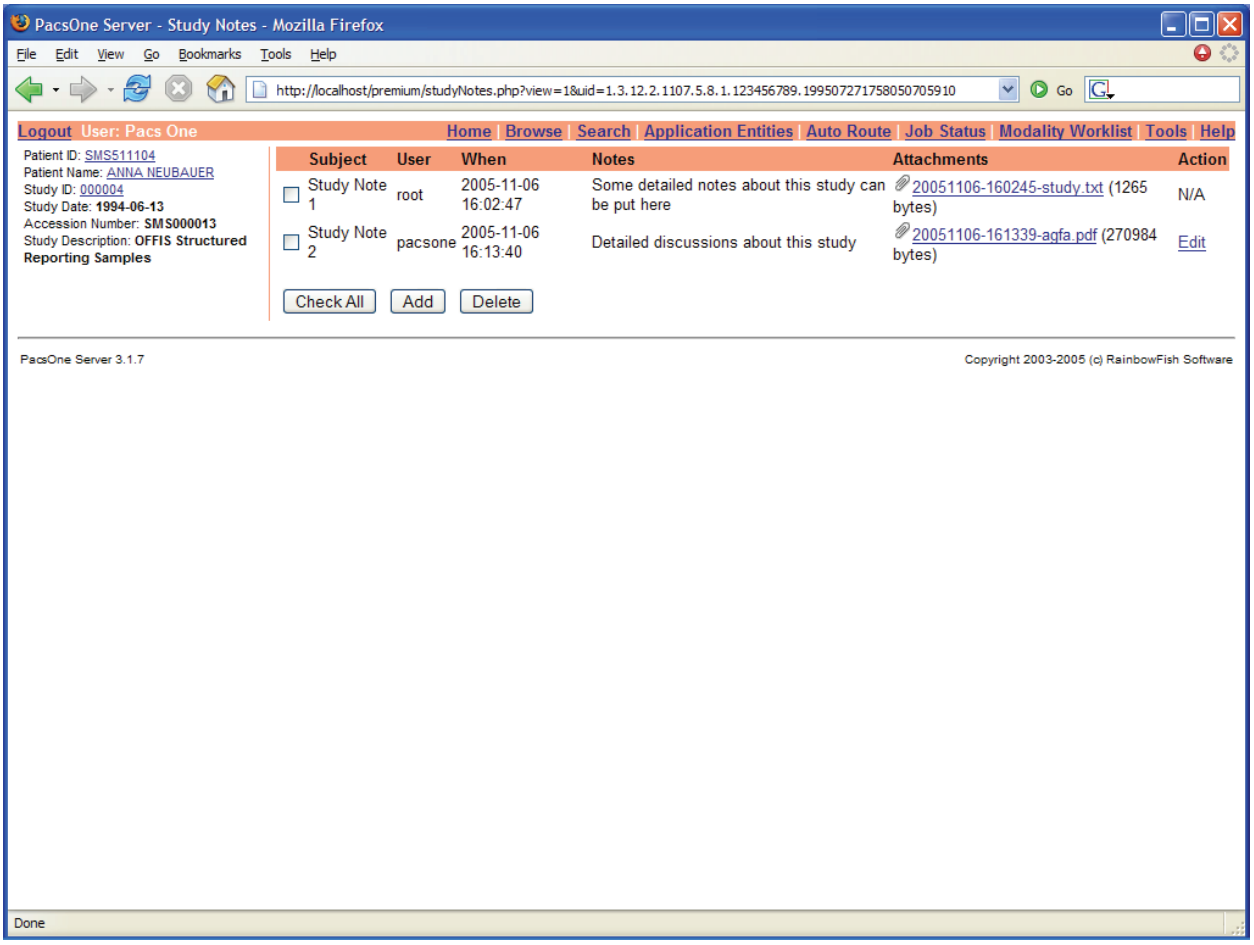

Figure 20 Study Notes Page

This page is the where all the discussion notes about this subject study are listed. If the logged-in user has the '**`Modify`**' privilege enabled, the user can delete any notes on this page. Otherwise, the user can only delete those notes entered by the user himself/herself. The user can also modify any note which was previously entered by himself/herself by clicking on the '**`Edit`**' link.

13.9 Structured Reports

If the selected study contains any DICOM Structured Report (**SR**), they will also be displayed as separate series along with the regular imaging series of the selected study.

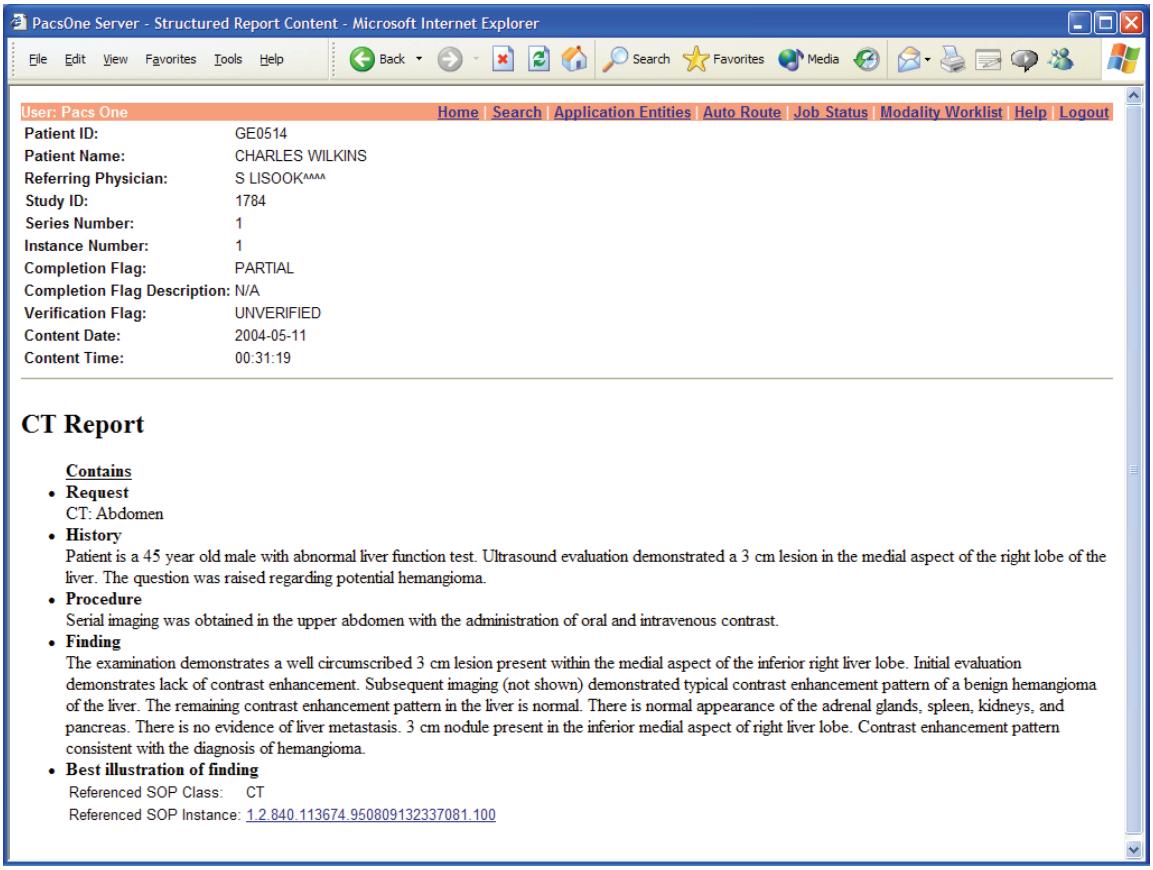
PacsOne Server - Structured Report Content - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
User: Pacs One
Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Help | Logout
Patient ID: GE0514
Patient Name: CHARLES WILKINS
Referring Physician: S LISOOK^^^^
Study ID: 1784
Series Number: 1
Instance Number: 1
Completion Flag: PARTIAL
Completion Flag Description: N/A
Verification Flag: UNVERIFIED
Content Date: 2004-05-11
Content Time: 00:31:19
CT Report
Contains
Request
CT: Abdomen
History
Patient is a 45 year old male with abnormal liver function test. Ultrasound evaluation demonstrated a 3 cm lesion in the medial aspect of the right lobe of the liver. The question was raised regarding potential hemangioma.
Procedure
Serial imaging was obtained in the upper abdomen with the administration of oral and intravenous contrast.
Finding
The examination demonstrates a well circumscribed 3 cm lesion present within the medial aspect of the inferior right liver lobe. Initial evaluation demonstrates lack of contrast enhancement. Subsequent imaging (not shown) demonstrated typical contrast enhancement pattern of a benign hemangioma of the liver. The remaining contrast enhancement pattern in the liver is normal. There is normal appearance of the adrenal glands, spleen, kidneys, and pancreas. There is no evidence of liver metastasis. 3 cm nodule present in the inferior medial aspect of right liver lobe. Contrast enhancement pattern consistent with the diagnosis of hemangioma.
Best illustration of finding
Referenced SOP Class: CT
Referenced SOP Instance: 1.2.840.113674.950809132337081.100

Figure 21 Structured Report Page

If the structured report document contains reference(s) to any image instances and they are accessible in the PacsOne database, a URL link to each referenced image instance will be displayed instead of the plain instance UID string.

13.10 Image Page (Thumbnail)

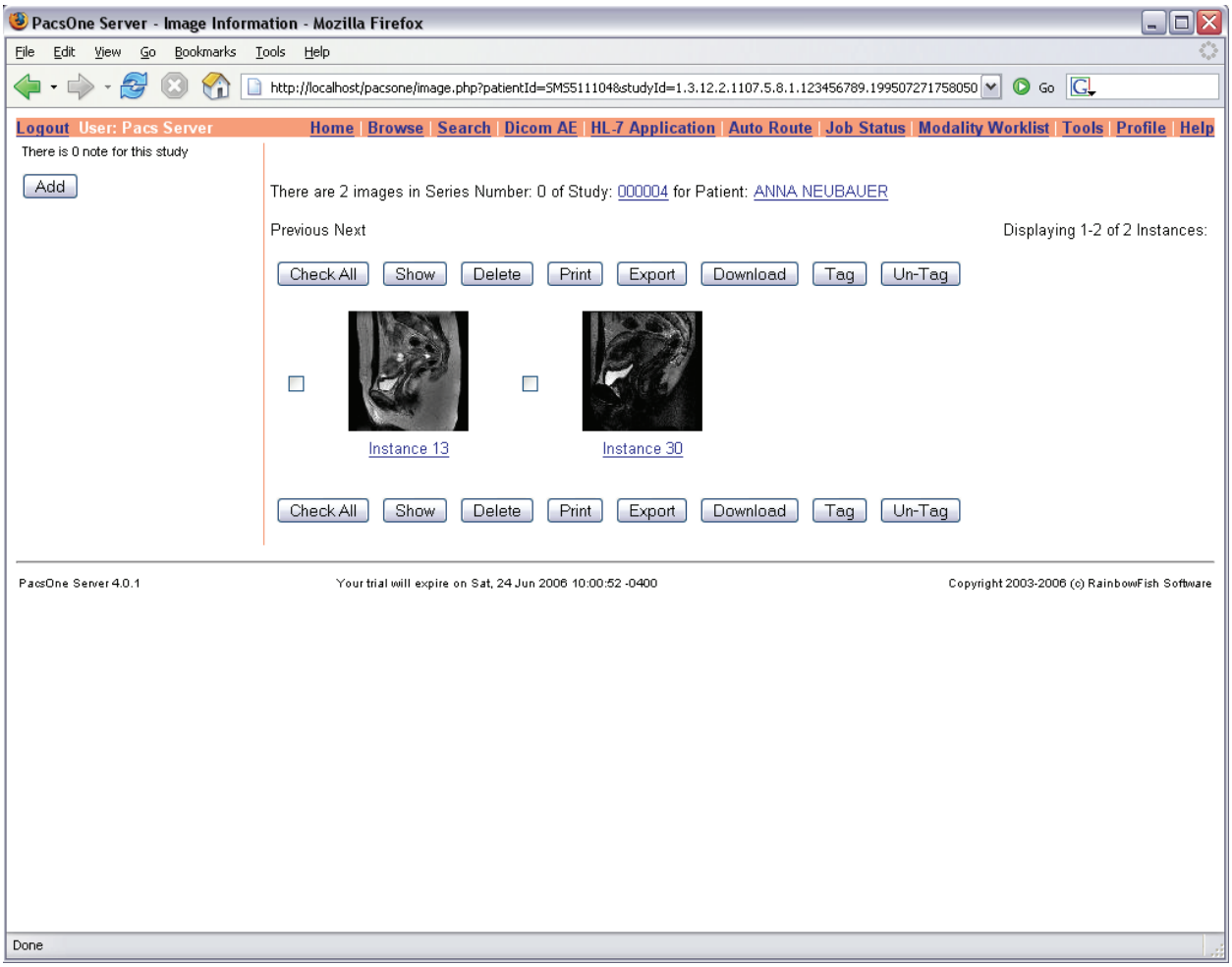

Figure 22 Image Page (Thumbnail)

This page displays a list of images of a selected series for the current user, with the following image-specific information depending on the privilege level of the current user:

- `Thumbnail Image` – Clicking on the thumbnail image will display the 'Full Size Image' page which is described in Section 13.11 below, instead of the thumbnail image displayed in the current page.
- `Instance #` – Clicking on this link will display all the Dicom attributes (tags) encoded in the raw image file.
- `Check All/Uncheck All` – This button is displayed only if the current user has the '**`Modify`**' privilege '`Enabled`'. Clicking on the '**`Check All`**' or '**`Uncheck All`**' button toggles between selecting all images and un-selecting all images.
- `Delete` – This button is displayed only if the current user has the '**`Modify`**' privilege is '`Enabled`'. Clicking on this button will pop-up a message box asking for confirmation to delete the selected image(s) from PacsOne database. If confirmed, the selected image(s) will be removed from the PacsOne database.
- `Download` – This button is '`Enabled`' only if the current user has the '**`Download`**' privilege is '`Enabled`'. Clicking on this button will download the selected images compressed into a ZIP file to the web browser.
- `Show` – If the Java Applet Viewer (e.g., the AiViewer, the Radscaper, or RemotEye Viewer) or the Active-X Viewer (e.g., iQ-X) is installed properly, this button will be displaying and clicking on this button will launch the Java Applet Viewer application.

- `Tag/Un-Tag` – Clicking on the '**`Tag`**' button will mark the selected images as key images, while clicking on the '**`Un-Tag`**' button will un-mark the selected images as key images.
- `Print` – This button is '`Enabled`' only if the current user has the '**`Print`**' privilege is '`Enabled`'. Clicking on this button will download print the selected images to a Dicom printer
- `Export` – This button is '`Enabled`' only if the current user has the '**`Export`**' privilege is '`Enabled`'. Clicking on this button will export the selected images into a Dicom Part-10 formatted destination folder.

13.11 Image Page (Full Size)

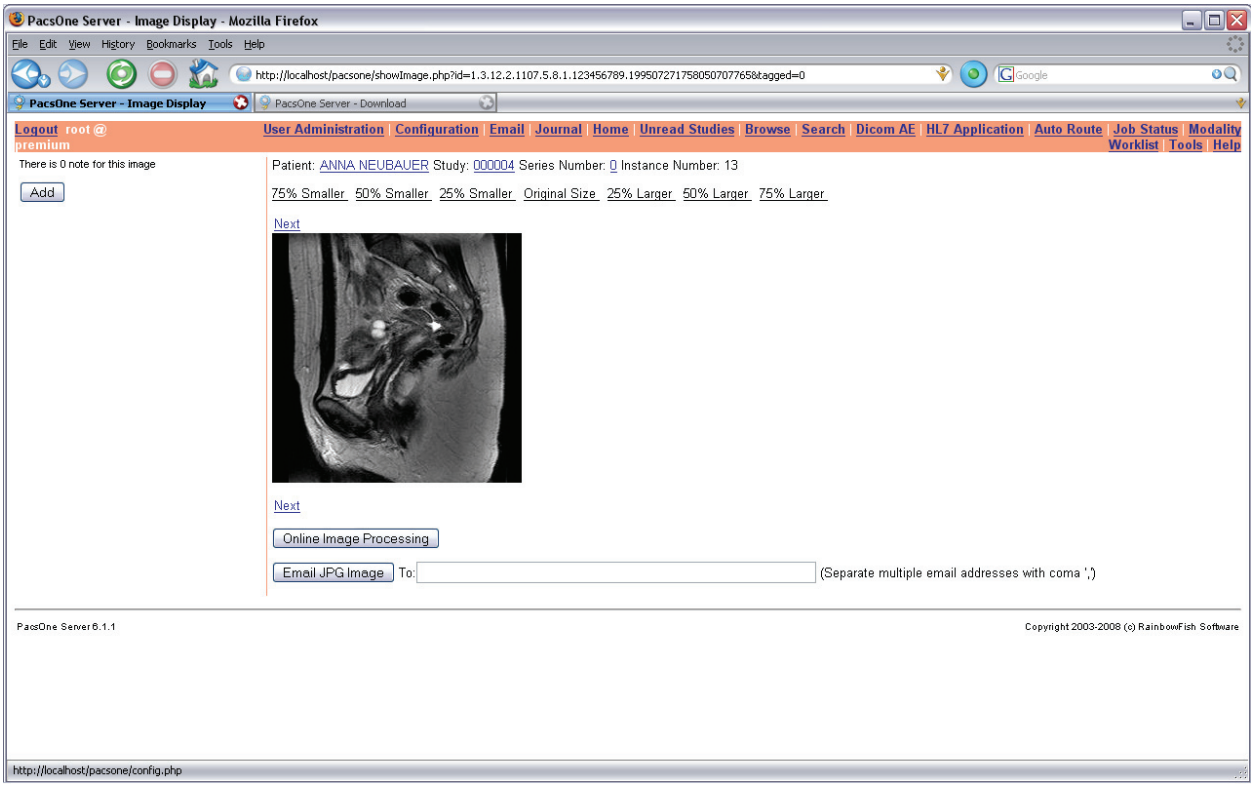
PacsOne Server - Image Display - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost/pacsone/showImage.php?id=1.3.12.2.1107.5.8.1.123456789.19950727175805070765&tagged=0
PacsOne Server - Image Display
PacsOne Server - Download
Logout root @ premium
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
There is 0 note for this image
Add
Patient: ANNA NEUBAUER Study: 000004 Series Number: 0 Instance Number: 13
75% Smaller 50% Smaller 25% Smaller Original Size 25% Larger 50% Larger 75% Larger
Next
Next
Online Image Processing
Email JPG Image To: (Separate multiple email addresses with coma ',')
PacsOne Server 6.1.1
Copyright 2003-2008 (c) RainbowFish Software
http://localhost/pacsone/config.php

Figure 23 Image Page (Full Size)

This page displays the selected image in its original size, with the following navigation links:

- `Previous` – This link will be displayed if there is an image within the same series with a smaller instance number than the currently displayed image. Clicking on this link will scroll **`backward`** to display the image with the largest instance number lower than the current instance.
- `Next` – This link will be displayed if there is an image within the same series with a bigger instance number than the currently displayed image. Clicking on this link will scroll **`forward`** to display the image with the smallest instance number higher than the current instance.
- `Previous Series` – This link will be displayed if there is another series within the same study with a smaller series number than the currently displayed series. Clicking on this link will scroll **`backward`** to display the series with the largest series number lower than the current series.
- `Next Series` – This link will be displayed if there is another series within the same study with a bigger series number than the currently displayed series. Clicking on this link will scroll **`forward`** to display the series with the smallest series number higher than the current series.
- `Online Image Processing` – Clicking on this button will display the '`Online Image Processing`' page, which is described in Section 13.13 - Online Image Processing Page below.

- `Email JPG Image` – Clicking on this button will send the converted JPG or GIF image being displayed to the registered email address of the current user. Users can also enter the destination email address in the "**`To:`**" field, and multiple email addressed can be entered by using the coma ("**`,`**") as the separator.

This page also displays a list of user notes about the subject image on the left panel, where the logged-in user can add discussion notes about this image by clicking on the '**`Add`**' button.

13.12 Image Notes Page

This page is used for registered users to exchange discussion notes about a subject image. Users can add, modify or delete notes with a subject headline and detailed text notes as bulletin-board style discussions about the subject image. Users with '**`Upload`**' privilege can also upload text files, PDF/Word documents, as well as audio/video clips as attachments to the related image notes.

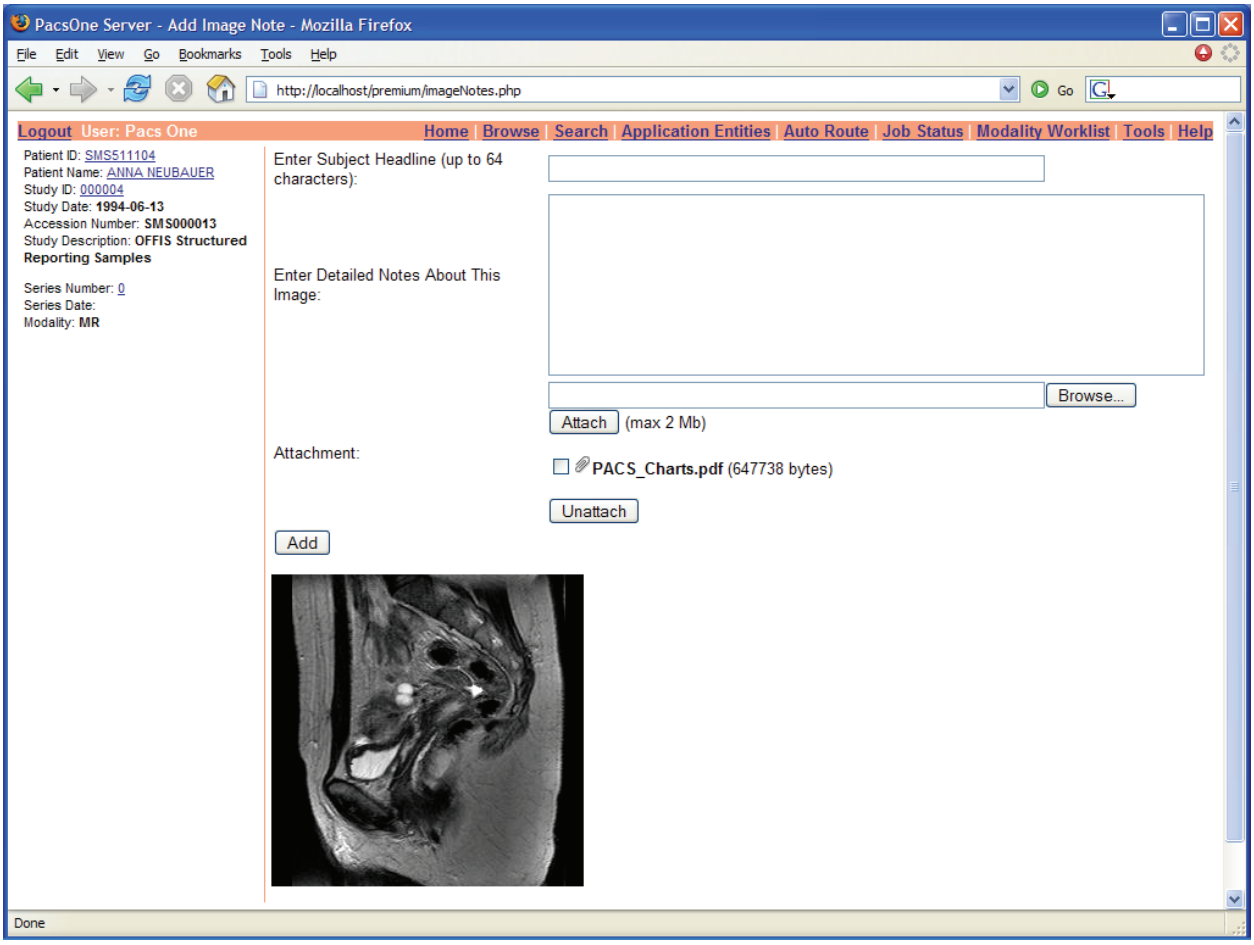
PacsOne Server - Add Image Note - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/premium/imageNotes.php
Go
Logout User: Pacs One
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Patient ID: SMS511104
Patient Name: ANNA NEUBAUER
Study ID: 000004
Study Date: 1994-06-13
Accession Number: SMS000013
Study Description: OFFIS Structured Reporting Samples
Series Number: 0
Series Date:
Modality: MR
Enter Subject Headline (up to 64 characters):
Enter Detailed Notes About This Image:
Browse...
Attach (max 2 Mb)
Attachment:
PACS_Charts.pdf (647738 bytes)
Unattach
Add
Done

Figure 24 Add Image Notes

From the "`Add Image Notes`" page above, users can enter discussion notes about this image, and each note consists of the following information:

- `Subject Headline` – Any text of up to 64 characters
- `Details Notes` – Any text of up to 512 characters

- `Attachments` – If the logged-in user has the '**`Upload`**' privilege enabled, users can upload additional files such as text files, PDF/Word documents, zip files, audio/video clips, etc. of maximum file size allowed for file uploads. This limit is controlled by the smaller value of the following two variable:
    - **`$MAX_UPLOAD_LIMIT`** system configuration variable described in Section 7 - System Configuration
    - **`upload_max_filesize`** variable in your '**`PHP.INI`**' file

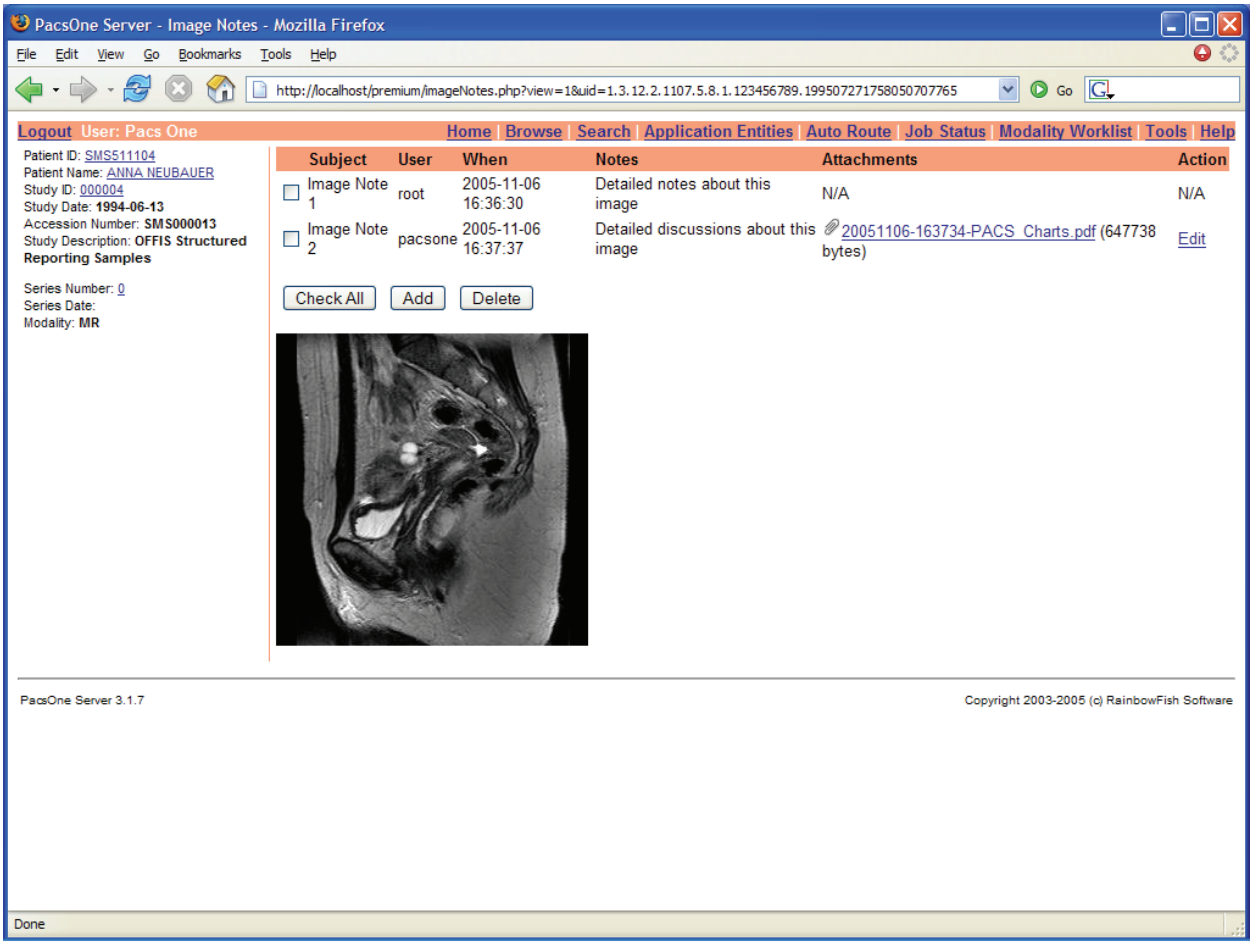

Figure 25 Image Notes Page

This page is the where all the discussion notes about this subject image are listed. If the logged-in user has the '**`Modify`**' privilege enabled, the user can delete any notes on this page. Otherwise, the user can only delete those notes entered by the user himself/herself. The user can also modify any note which was previously entered by himself/herself by clicking on the '**`Edit`**' link.

13.13 Online Image Processing Page

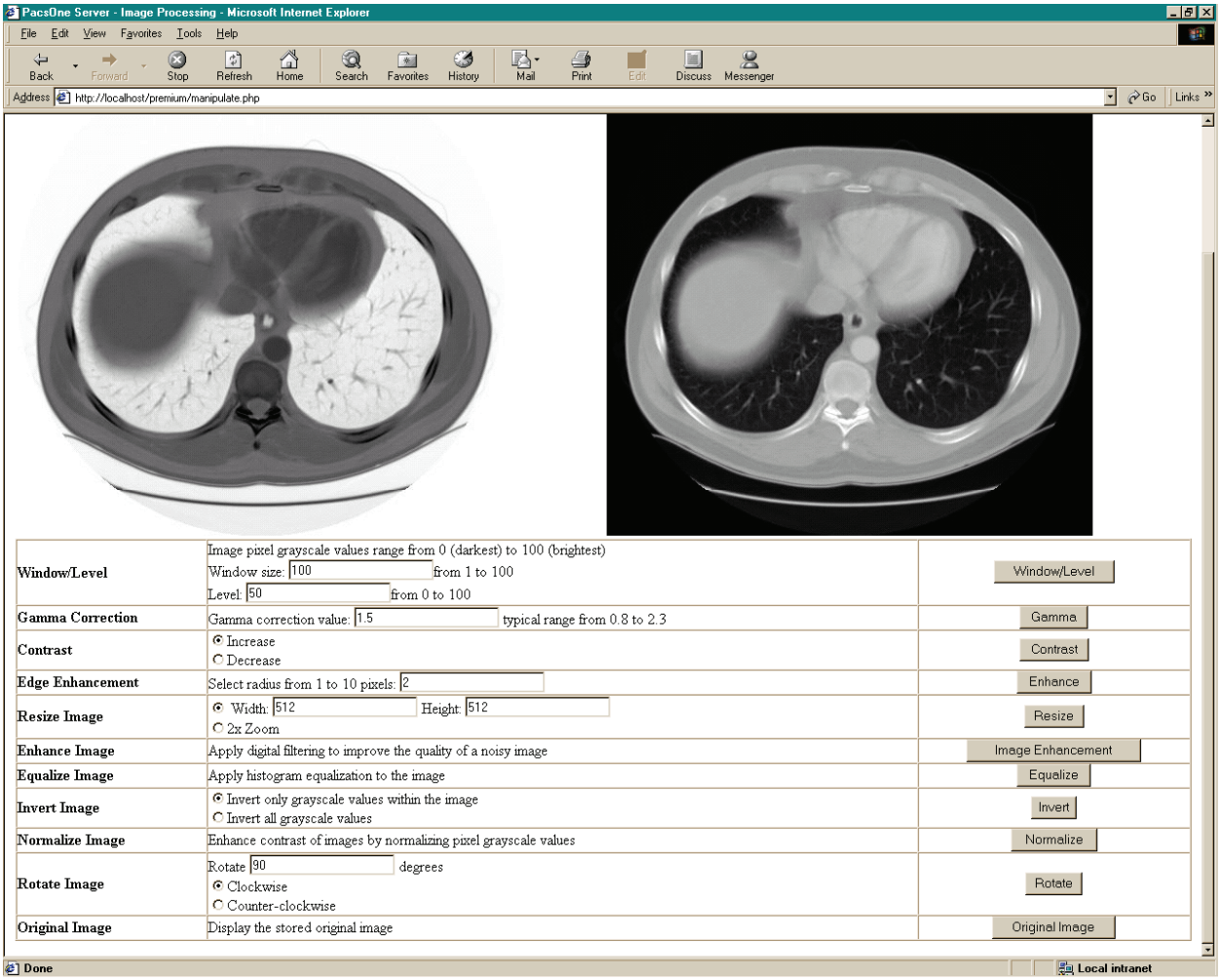

Figure 26 Online Image Processing Page

This page offers the following set of image processing tools, with the processed image displayed on the left and a reference image (original) displayed on the right:

- `Window/Level`
- `Gamma Correction`
- `Contrast`
- `Edge Enhancement`
- `Resize Image` – Resize image in absolute pixels or simple 2x zoom
- `Enhance Image` – Remove image noise
- `Equalize Image` – Apply histogram equalization to the image
- `Invert Image`
- `Normalize Image` – Normalize grayscale values of image pixels
- `Rotate Image`
- `Original Image` – Switch back to the original image

13.14 Tools Page

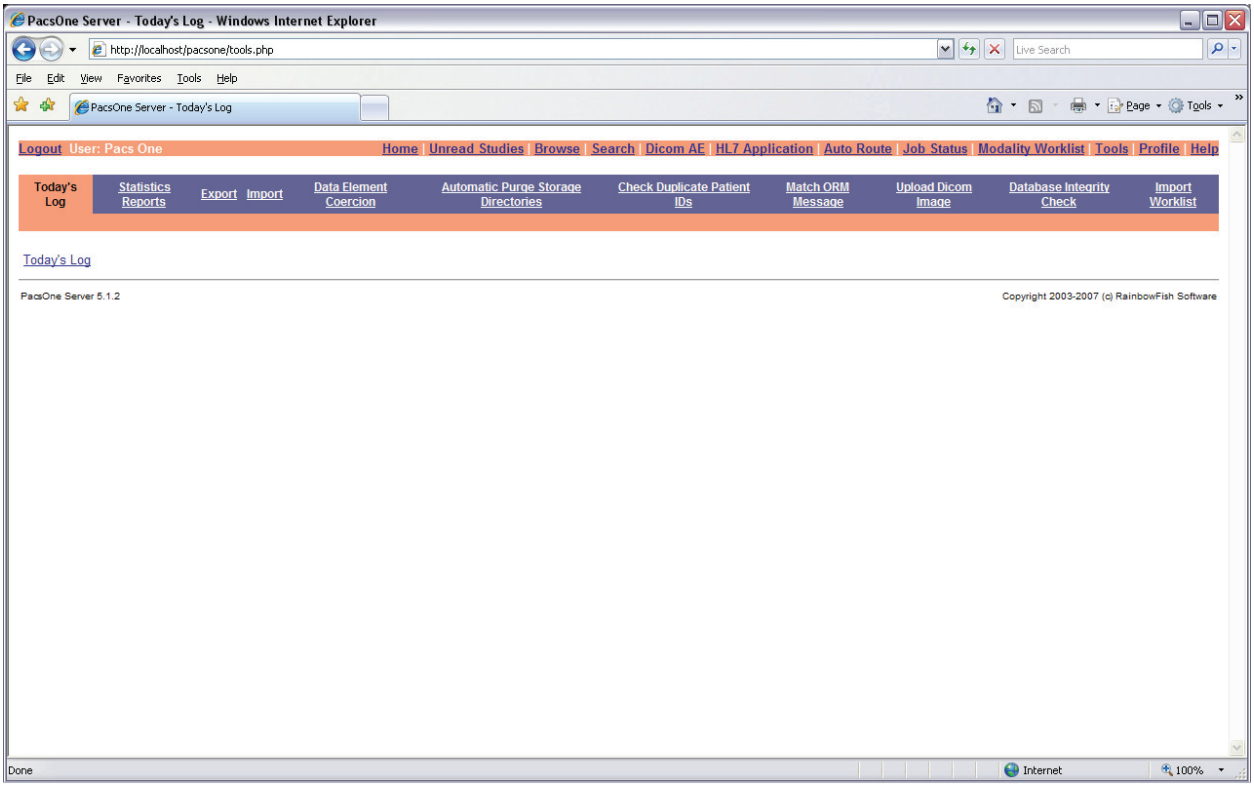
PacsOne Server - Today's Log - Windows Internet Explorer
http://localhost/pacsone/tools.php
File Edit View Favorites Tools Help
PacsOne Server - Today's Log
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Today's Log
Statistics Reports
Export Import
Data Element Coercion
Automatic Purge Storage Directories
Check Duplicate Patient IDs
Match ORM Message
Upload Dicom Image
Database Integrity Check
Import Worklist
Today's Log
PacsOne Server 5.1.2
Copyright 2003-2007 (c) RainbowFish Software
Done
Internet
100%

Figure 27 Tools Page

This page contains the following useful utilities that enhance the functionalities of PacsOne Server Premium Edition:

13.14.1 Custom Data Element Coercion

This tool allows PacsOne users to define a custom data element coercion pattern for images received from a source AE. The following data elements can be coerced based on the specified coercion pattern:

- Patient ID (0x00100020)
- Modality (0x00080060)
- Institution Name (0x00080080)
- Accession Number (0x00080050)
- Ethnic Group (0x00102160)

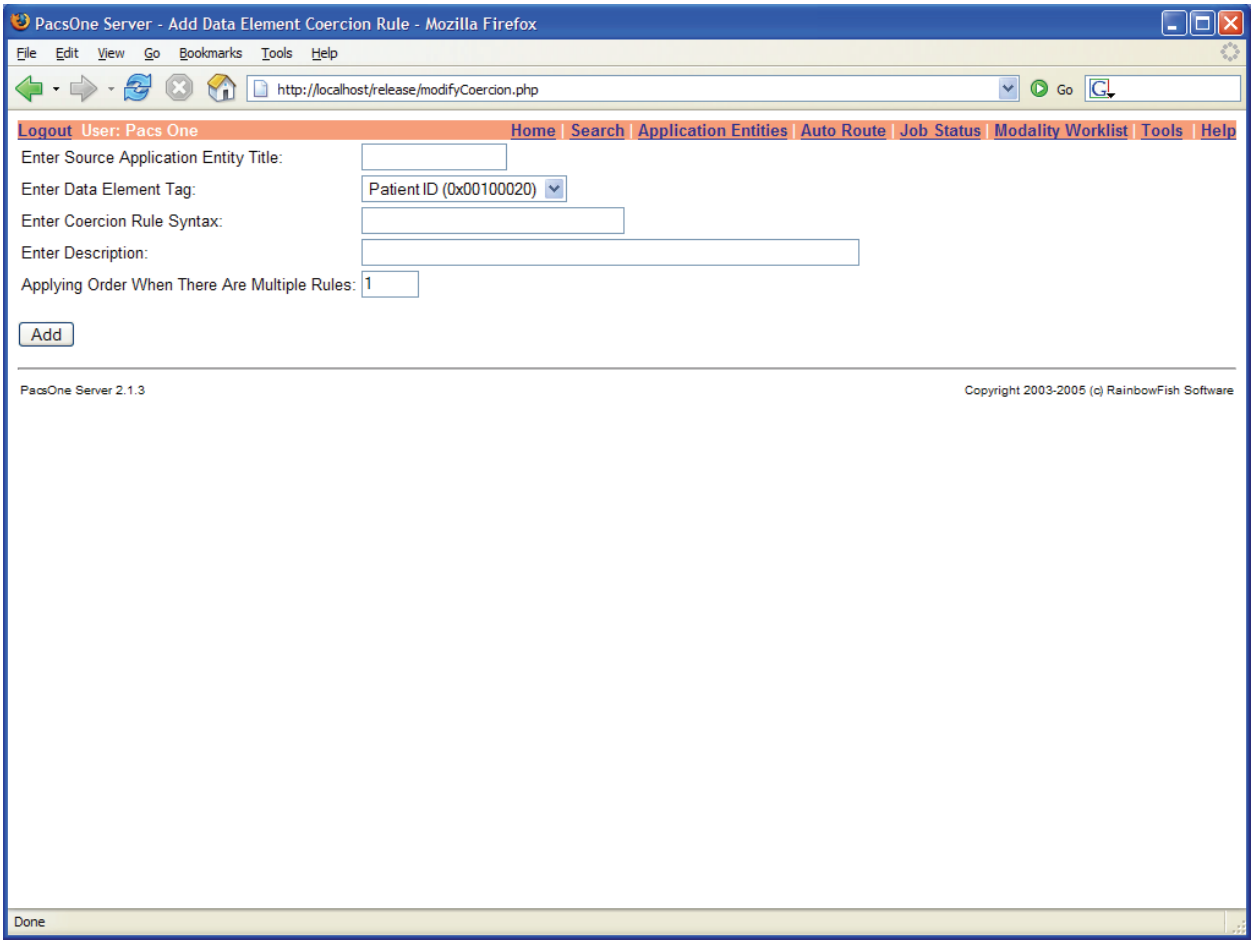
PacsOne Server - Add Data Element Coercion Rule - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/release/modifyCoercion.php
Go
Logout User: Pacs One
Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Enter Source Application Entity Title:
Enter Data Element Tag:
Patient ID (0x00100020)
Enter Coercion Rule Syntax:
Enter Description:
Applying Order When There Are Multiple Rules:
1
Add
PacsOne Server 2.1.3
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 28 Data Element Coercion Page

The coercion pattern syntax specifies the pattern string to be coerced into, and wild-card characters '**`*`**' and '**`?`**' are supported.

For example, if users want to have a prefix string "`ABC`" inserted to the Patient ID data element for images received from a source AE "`XYZ`", before the images are stored in the PacsOne Server database. They can add a data element coercion rule with the following fields:

- `Source Application Entity Title` - It will be set to "`XYZ`" in this example
- `Data Element Tag` - Select Patient ID from the Drop-down list box
- `Coercion Rule Syntax` - It will be set to "`ABC*`" in this example meaning to insert the prefix "`ABC`" before the received Patient ID string
- `Description` - This field is for display purpose only and can be set to any text string

With the above example coercion rule, an image received from source AE "`XYZ`" with the Patient ID of "`12345`" will be received and stored in PacsOne Server database with the Patient ID of "`ABC12345`".

To delete a specific data element, you can define a Data Element Coercion rule with the corresponding data element tag, and the coercion rule syntax of "**`*->`**", so that PacsOne Server will remove the defined data element from the received images from that source AE. Here are some details examples about the coercion rules:

Pattern	Meaning	Example
123-*	Add prefix "123-" to the existing/received value	With the "123-*" pattern defined as Patient ID coercion rule, the received Patient ID "ABCDE" becomes "123-ABCDE"
*-123	Add suffix "-123" to the existing/received value	With the "*-123" pattern defined as Patient ID coercion rule, the received Patient ID "ABCDE" becomes "ABCDE-123"
*->12345	Replace existing/received value with the fixed string "12345"	With the "*->12345" pattern defined as Patient ID coercion rule, the received Patient ID "ABCDE" becomes "12345"
*->	Delete the existing value	With the "*->" pattern defined as Accession Number coercion rule, the received Accession Number "ABCDE" will be deleted
*->{0-9}	Keep only the numbers (0-9) within the received value string	With the "*->{0-9}" pattern defined as Accession Number coercion rule, the received Accession Number "ABCDE12345" becomes "12345"
*->{A-Z}	Keep only the alphabetic characters ('A'-'Z') within the received value string	With the "*->{A-Z}" pattern defined as Accession Number coercion rule, the received Accession Number "ABCDE12345" becomes "ABCDE"

Table 7 Data Element Coercion Rule Patterns

13.14.2 Exporting Patients/Studies

This utility allows users to export patients/studies stored in PacsOne Server database to a local directory, using DICOM Media Storage Format (with DICOMDIR directory record). The content of the directory can later be burned into a CD-R/RW, DVD-R/RW/RAM or DVD+R/RW for media interchange.

Users need to enter the following information to export patients/studies:

- `Export Media Type` – Users can choose from CD, DVD or Dual-Layer DVD as media type for export destination. This field is used to determine the sub-directory name for the local export directory, as well as the media storage capacity (650 Mbytes CD, 4.7 GB DVD or 8.5 GB Dual-Layer DVD) when the exported studies need to be split into multiple volumes.
- `Export Directory` – This filed defaults to the '**export**' sub-directory where PacsOne Server is installed.
- `Media Label` – This field is limited to 16 characters and is the media label applied to the DICOMDIR directory record when it is written to the final destination media. In case the exported studies require multiple volumes, the volume number will automatically be appended to the media label for each volume. For example, if the specified media label is "LABEL", the selected media type is CD, and the total exported studies span across three volumes, there will be three sub-directories named '**vol1**' through '**vol3**' under the specified destination export directory, with the media label set to "**LABEL-1**" through "**LABEL-3**" accordingly.
- `Compress exported content into ZIP file` – Clicking on this checkbox will compress the exported content into ZIP files, which can be downloaded directly from the **Job Status** page when the Export job is completed.
- `Include External Viewer Program Files From Folder` – Selecting this checkbox will make PacsOne Server include all files as well as sub-directories from the specified folder as part of the export to the

destination directory. NOTE: Use caution when selecting this option and be sure not to include the wrong external viewer directory that contains too many files and/or sub-folders, since PacsOne Server will copy **recursively** all files and sub-directories under this viewer directory to the destination folder.

- `Update` – This button is used to update the current page with the calculated total number of selected studies and the total file storage space required to export the selected studies.
- `Export Studies` – After users have entered the destination directory for selected media type and the media label, they can click on this button to select from a list of patients/studies to export:

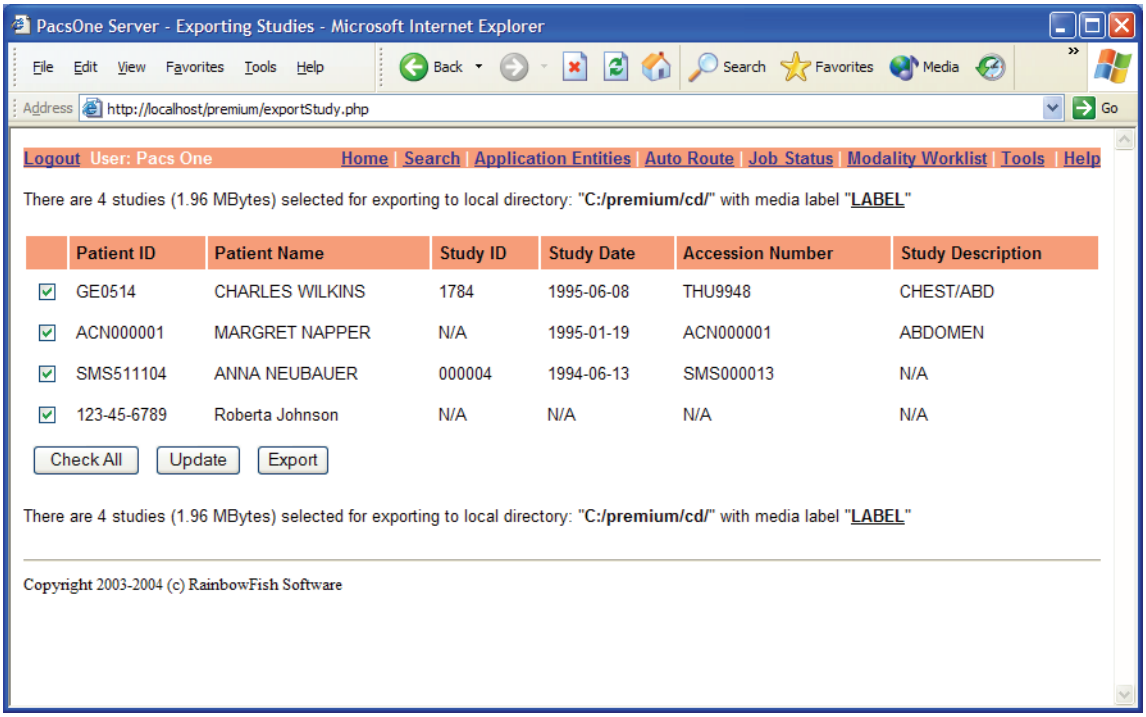
PacsOne Server - Exporting Studies - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://localhost/premium/exportStudy.php
Go
Logout User: Pacs One
Home | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
There are 4 studies (1.96 MBytes) selected for exporting to local directory: "C:/premium/cd/" with media label "LABEL"
Patient ID
Patient Name
Study ID
Study Date
Accession Number
Study Description
GE0514 CHARLES WILKINS 1784 1995-06-08 THU9948 CHEST/ABD
ACN000001 MARGRET NAPPER N/A 1995-01-19 ACN000001 ABDOMEN
SMS511104 ANNA NEUBAUER 000004 1994-06-13 SMS000013 N/A
123-45-6789 Roberta Johnson N/A N/A N/A N/A
Check All
Update
Export
There are 4 studies (1.96 MBytes) selected for exporting to local directory: "C:/premium/cd/" with media label "LABEL"
Copyright 2003-2004 (c) RainbowFish Software

Figure 29 Export Patients/Studies Page

Users can select the interested patients/studies by clicking the checkbox at the beginning of each listed study, and click on the '**`Update`**' button to obtain the total number of studies selected and the total storage space required for exporting the selected studies. After selecting the interested patients/studies for export, the users can click on the '**`Export`**' button to start the export, PacsOne Server will assign a database job to perform the export in the background so that it will not tie up the user interface. Users can check the progress of the export job at any time by visiting the '`Job Status`' page, using the assigned job ID.

13.14.3 Importing External Patients/Studies

This utility allows users to import external patients/studies stored in DICOM Media Storage Format compliant (with or without **DICOMDIR** directory record) CD/DVD media into the PacsOne Server database.

Users need to enter the following information to import external patients/studies into the PacsOne Server database:

- `Source Media Type` – This can either be a Local Directory written in the DICOM Media Storage Format (with or without **DICOMDIR** directory record), or a local CD/DVD media drive.

  - If the source media type is a DICOM Media Storage Formatted local directory, PacsOne Server will read the **DICOMDIR** directory record if it is present, parse any raw image file(s) encoded in DICOM Part 10 format recursively under the specified directory into the PacsOne Server database. The database records are linked to the raw image files in the specified directory, so the raw image files do not need to be copied.

- If the source media type is a local CD/DVD media drive, PacsOne Server will read the DICOMDIR directory record, parse the directory into the PacsOne Server database, and copy the raw image files on the removable media into a destination local directory specified by the user.

- `Destination Directory` – If the specified source media type is a local CD/DVD drive, users will also need to specify a local destination directory to copy the raw images files on the local media to.
- `Import Studies` – After user has entered the information above, user can click on this button to start the import.

When importing external images from a local directory but there is no **DICOMDIR** directory record present in the specified directory, PacsOne Server will display a warning message below before trying to parse recursively any DICOM Part 10 encoded image files stored in the directory into the PacsOne Server database.

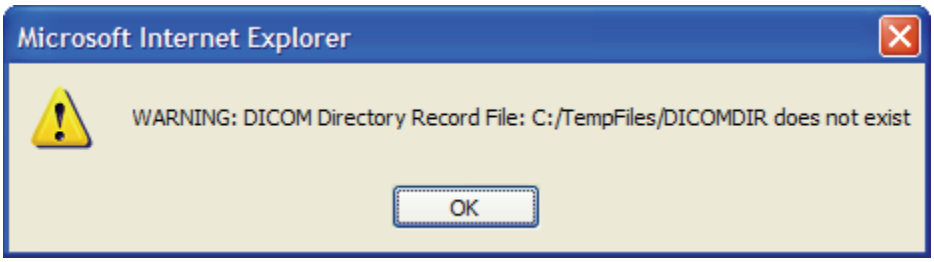

Figure 30 Warning Message for Importing without DICOMDIR

PacsOne Server will assign a database job to perform the import in the background so that it will not tie up the user interface. Users can check the progress of the import job at any time by visiting the '`Job Status`' page, using the assigned job ID.

13.14.4 Statistics Reports

This feature allows the Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases) or users with '**`View`**' privilege to query statistics reports for studies received during different time periods:

- `Studies Received Yesterday`
- `Studies Received This Week`
- `Studies Received This Month`
- `Studies Received This Year`
- `Studies Received During a [`**`From, To`**`] date window`
- `Studies Received From a Specific Source AE`
- `Studies Received From Each Source AE defined in the "`**`Dicom AE`**`" page`

The Statistics Report page will be displayed after user clicks on the Get Report button. In addition to the study information displayed, the following attributes will be displayed for each study:

- `The date the study was received`
- `The Source AE Title from where the study was received`
- `The total number of images currently in this study`
- `The total size of the raw images file currently in this study`

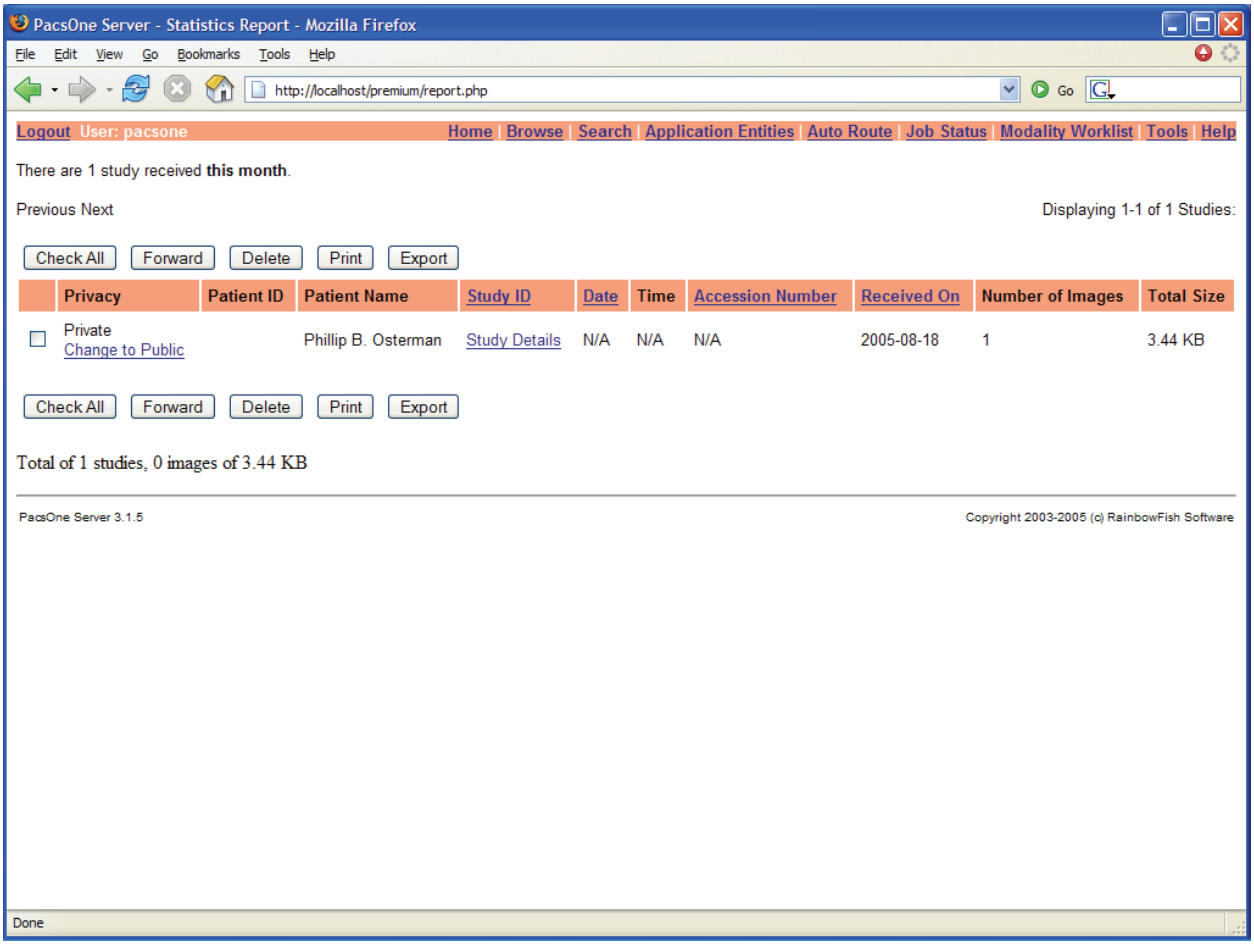

Figure 31 Statistics Report Page

13.14.4.1 Automatic Statistics Reports via Email

If a valid SMTP server and the Administrator ('**`root`**' for MySQL or '**`SYSTEM`**' for Oracle databases)'s email address have been configured (See Section 7 above), then PacsOne Server will send statistics report emails to the Administrator's email address based on the following schedule:

- `Daily Reports` – PacsOne Server will send statistics report for studies received during the previous day at 12:00 am local time every day
- `Weekly Reports` - PacsOne Server will send statistics report for studies received during the previous week at 12:00 am local time on every Sunday
- `Monthly Reports` - PacsOne Server will send statistics report for studies received during the previous month at 12:00 am local time on the first day of every month

13.14.5 Automatic Purging Archive Directories

This feature is useful when the storage resources are limited on the server where PacsOne Server is installed, and the Administrators want to have PacsOne Server automatically purge older studies stored in the PacsOne Server database, by pre-defining a set of rules or parameters for automatic purging.

For Administrators (Users with '**`Modify`**' privilege), they can click on the **Automatic Purge Storage Directories** link from the **Tools** page to define the following set of parameters PacsOne Server:

- `Low Water Mark` – This field is defined in terms of disk free space percentage ranging from 0 to 100. For each defined archive directory, PacsOne Server will examine the disk usage information for the disk where the archive directory is located. If the disk free space percentage is lower than this defined **`Low Water Mark`**, PacsOne Server will start purging older studies stored on this disk.
- `High Water Mark` - This field is defined in terms of disk free space percentage ranging from 0 to 100. This field must be greater than the value defined for the **`Low Water Mark`** above. When the disk free space percentage drops below the **`Low Water Mark`** defined above, PacsOne Server will start to purge older studies stored in the corresponding archive directory. PacsOne Server will sort the list of studies stored in this archive directory by the **Date** the studies were received, with the oldest study being the top of the list. PacsOne Server will purge studies in the sorted list (removing the oldest study first) one at a time, until the disk free space percentage rises above the defined **High Water Mark**, at which point the automatic purging operation is then complete.
- `Purge by Study Received Date (when study was received)` – If this option is selected, PacsOne Server will purge all older studies that were received more than N days ago.
- `Purge by Study Date (when study was acquired or created)` – If this option is selected, PacsOne Server will purge all older studies with Study Date of more than N days ago.
- `Purge by Source AE Title` – If this option is selected, PacsOne Server will purge all studies received from the specified Source AE Title.
- `Schedule` – Automatic purging schedule defined in terms of the 24-hour interval. PacsOne Server will perform automatic purging **only** on this scheduled hour of the day, and will not perform another automatic purging for the same rule until the next 24-hour schedule.

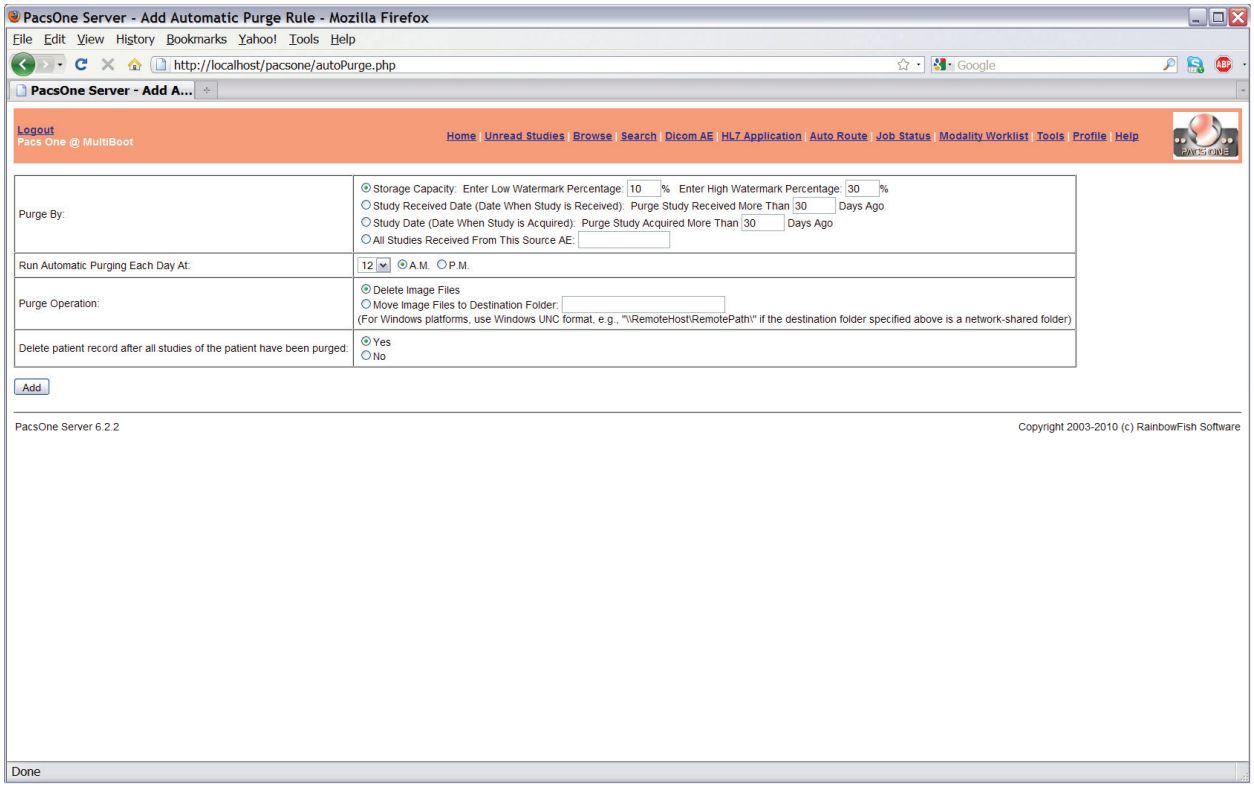
PacsOne Server - Add Automatic Purge Rule - Mozilla Firefox
File Edit View History Bookmarks Yahoo! Tools Help
http://localhost/pacsone/autoPurge.php
PacsOne Server - Add A...
Logout
Pacs One @ MultiBoot
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Purge By:
Storage Capacity: Enter Low Watermark Percentage: 10 % Enter High Watermark Percentage: 30 %
Study Received Date (Date When Study is Received): Purge Study Received More Than 30 Days Ago
Study Date (Date When Study is Acquired): Purge Study Acquired More Than 30 Days Ago
All Studies Received From This Source AE:
Run Automatic Purging Each Day At:
12 A.M. P.M.
Purge Operation:
Delete Image Files
Move Image Files to Destination Folder:
(For Windows platforms, use Windows UNC format, e.g., "\\RemoteHost\RemotePath\" if the destination folder specified above is a network-shared folder)
Delete patient record after all studies of the patient have been purged:
Yes
No
Add
PacsOne Server 6.2.2
Copyright 2003-2010 (c) RainbowFish Software
Done

Figure 32 Automatic Purging Archive Directories

- `Purge Option` – When purging aged studies, user can select whether to:

  - Permanently delete the aged studies
  - Move them to a user-defined destination folder, for example: a shared network drive, so that they are still accessible but do not consume any more online storage resources. Note: For Windows platforms, any

shared network path must be entered in the Windows UNC format as `\\RemoteHost\RemotePath\`, instead of the mapped drive path such as `Z:\LocalPath`

NOTE:

Caution must be taken when defining the `Low/High Water Marks` for the automatic purging operation, as PacsOne Server will remove all series and images of the purged study. Make sure a reasonable set of numbers is chosen for the `Low/High Water Marks`. By default, the `Low Water Mark` is set to 5 (percent) and `High Water Mark` set to 10 (percent). It is recommended to disable this feature if there are enough storage resources available.

13.14.5.1 Automatic Purging By Dicom Data Element Filters

Users can also define individual Dicom data element filter with wild-card patterns, so that PacsOne Server will automatically purge the matching Dicom studies based on the user-defined aging period and schedule.

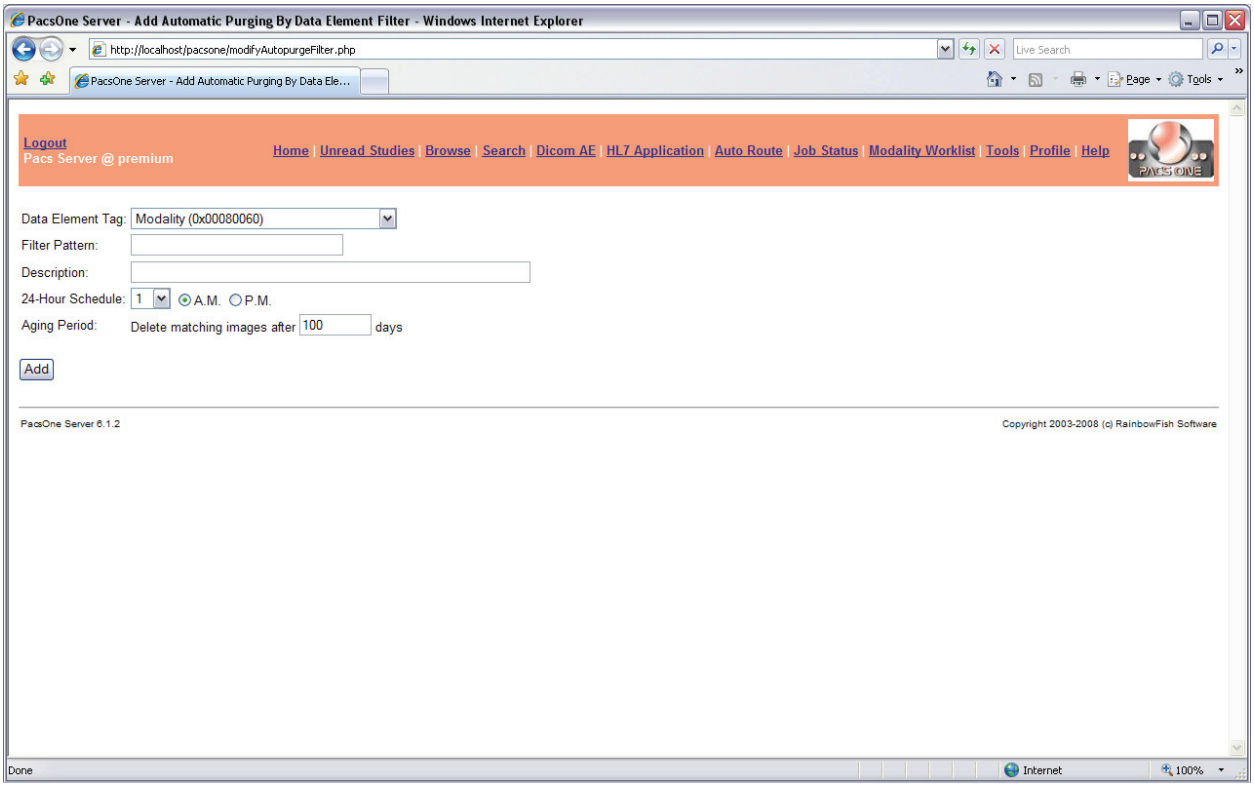
PacsOne Server - Add Automatic Purging By Data Element Filter - Windows Internet Explorer
http://localhost/pacsone/modifyAutopurgeFilter.php
Logout
Pacs Server @ premium
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Data Element Tag: Modality (0x00080060)
Filter Pattern:
Description:
24-Hour Schedule: 1 A.M. P.M.
Aging Period: Delete matching images after 100 days
Add
PacsOne Server 6.1.2
Copyright 2003-2008 (c) RainbowFish Software
Done
Internet
100%

Figure 33 Automatic Purging By Dicom Data Element Filter

- `Data Element Tag` – Currently the following Dicom data elements are supported:
  - Modality (0008,0060)
  - Institution Name (0008,0080)
  - Referring Physician's Name (0008,0090)
  - Study Description (0008,1030)
  - Reading Physician's Name (0008,1060)
  - Patient Name (0010,0010)

- `Filter Pattern` – This is the filtering pattern that will be used to match against the Dicom studies stored in the PacsOne Server database. Wild-card characters '`*`' and '`?`' are supported.
- `Description` – Brief description which described the defined filtering pattern.

- `24-Hour Schedule` – The schedule when PacsOne Server should run the Automatic Purging by the defined Dicom data element filtering rule.
- `Aging Period` – The time period in number of days. PacsOne Server will purge any matching Dicom study if the study was received before the defined aging period. The default value is 100 days.

For example, users can define the following Automatic Purging By Dicom Data Element rule:

- `Data Element Tag` – Modality (0008,0060)
- `Filter Pattern` – CT
- `Description` – Purge all CT studies received more than 100 days ago
- `24-Hour Schedule` – 1:00 AM
- `Aging Period` – 100 Days

With the above Automatic Purging rule, PacsOne will purge all CT studies stored in the database received more than 100 days ago every night at 1:00 AM local time.

13.14.6 Check Duplicate Patient IDs

Clicking on this URL link will display a list of duplicate patient IDs which have conflicts with existing patient IDs. All duplicate patient IDs will have the string format of **`"$ID[$SourceAeTitle-$TimeStamp]",`** where:

- `$ID` – The existing patient ID which has a different patient name from the duplicate
- `$SourceAeTitle` – The AE Title from which the images were received from
- `$TimeStamp` – The Date and Time stamp (in '`YYYYMMDDhhmmss`' format) of when the duplicate patient ID was received

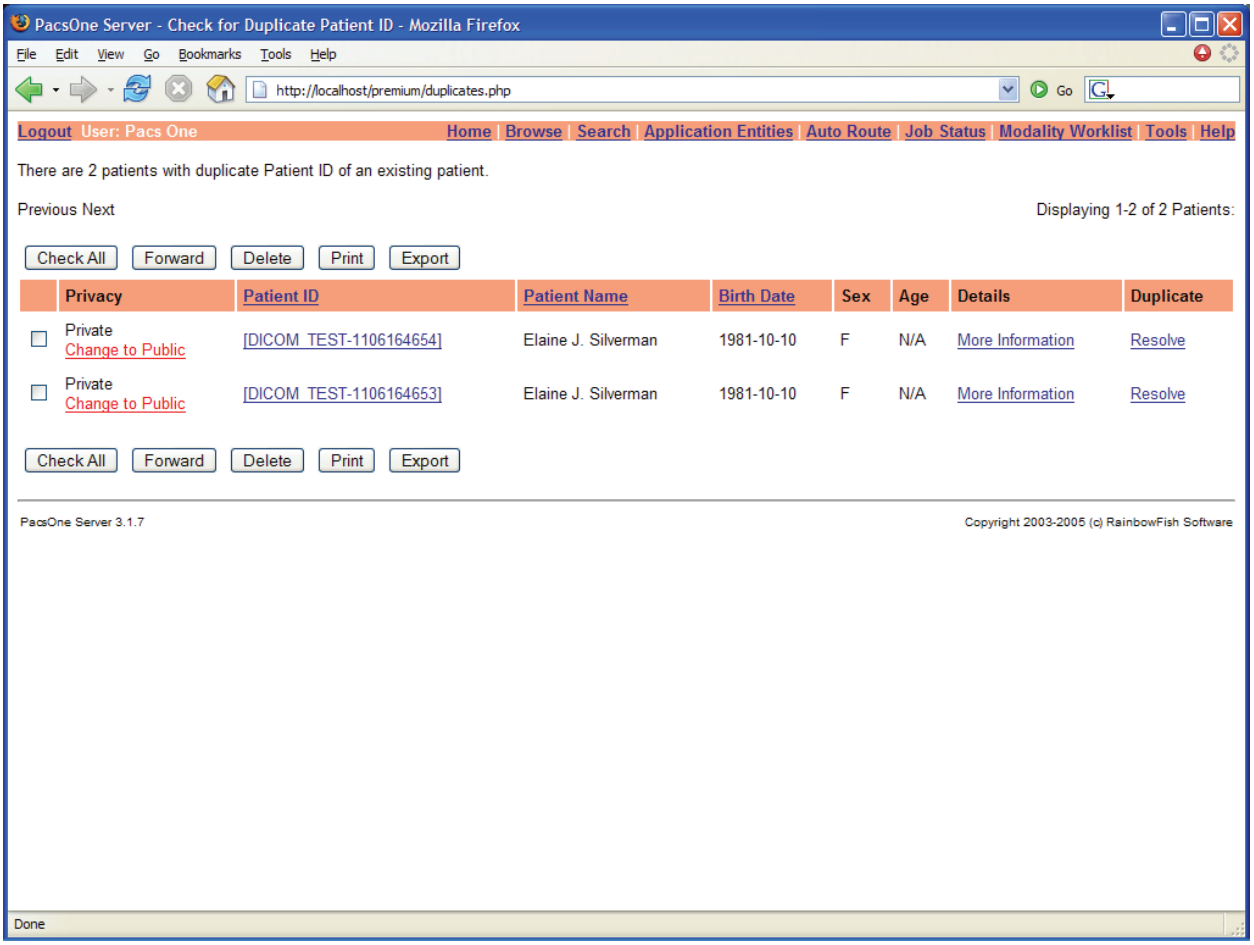

Figure 34 Checking Duplicate Patient ID

For example, there is an existing patient: "`Phillip B. Osterman`", with an empty patient ID string. A new study is sent by the AE '`DICOM_TEST`' to PacsOne Server with the same empty string as the patient ID, but with a different patient name: "`Elaine J. Silverman`". In this example, PacsOne will save the new study under a duplicate patient ID: '`[DICOM_TEST-1106164654]`' and flag this as a duplicate patient ID. The user can resolve this duplicate patient ID by clicking the '**`Resolve`**' link and select one of the following options:

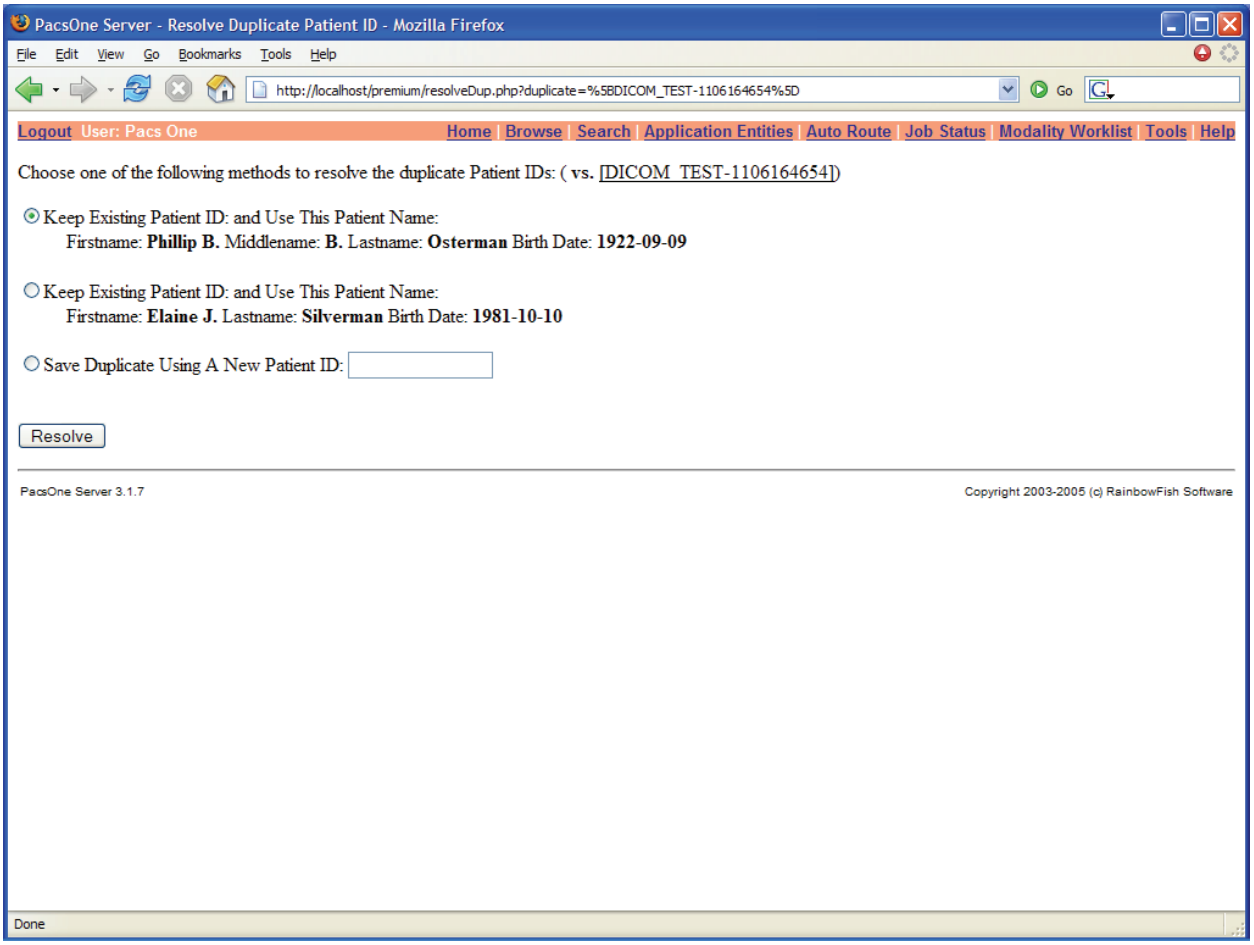
PacsOne Server - Resolve Duplicate Patient ID - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/premium/resolveDup.php?duplicate=%5BDICOM_TEST-1106164654%5D
Go
Logout User: Pacs One
Home | Browse | Search | Application Entities | Auto Route | Job Status | Modality Worklist | Tools | Help
Choose one of the following methods to resolve the duplicate Patient IDs: (vs. [DICOM_TEST-1106164654])
Keep Existing Patient ID: and Use This Patient Name:
Firstname: Phillip B. Middlename: B. Lastname: Osterman Birth Date: 1922-09-09
Keep Existing Patient ID: and Use This Patient Name:
Firstname: Elaine J. Lastname: Silverman Birth Date: 1981-10-10
Save Duplicate Using A New Patient ID:
Resolve
PacsOne Server 3.1.7
Copyright 2003-2005 (c) RainbowFish Software
Done

Figure 35 Resolving Duplicate Patient ID

- `Keep Existing Patient ID and Use the Existing Patient Name` – If this option is selected, the images labeled with the duplicate patient ID will be saved under the existing patient ID, and the existing patient name will be used. In the above example, the new study will be saved under the existing patient name of "`Phillip B. Osterman`".
- `Keep Existing Patient ID and Use the New Patient Name` – If this option is selected, the images received with the duplicate patient ID will be saved under the existing patient ID, and the new patient name will be used. In the above example, the new study will be saved under the new patient name of "`Elaine J. Silverman`".
- `Save Duplicate Using a New Patient ID` – If this option is selected, the images labeled with the duplicate patient ID will be saved under the newly assigned patient ID, and the new patient name will be used. In the above example, the new study will be saved under the new name of '`Elaine J. Silverman`' but with a newly assigned patient ID.
- `Use Patient Names From Modality Worklist Record` – If PacsOne Server finds a Modality Worklist Record with the existing Patient ID, this option will be displayed to let users choose the Patient Names from the Modality Worklist Record, PacsOne Server will then save both the existing and duplicate Patient IDs with the Patient Names from the Modality Worklist Record.

In most cases, the duplicates are created by human input error when entering patient names. For example, "`John Doe`" vs. "`Jane Doe`", and these duplicates can be resolved by selecting either the existing patient name or the new patient name and keep the same patient ID. However, in rare cases, the duplicate patient IDs do belong to two distinct patients with truly different identities. In this case, assigning a new patient ID may help temporarily, but the

ultimate solution is to fix the problem at the source, which is where the patient ID gets assigned at the local RIS/HIS systems.

13.14.7 Today's Log File

Clicking on this link will display the PacsOne Server log file from today to the browser.

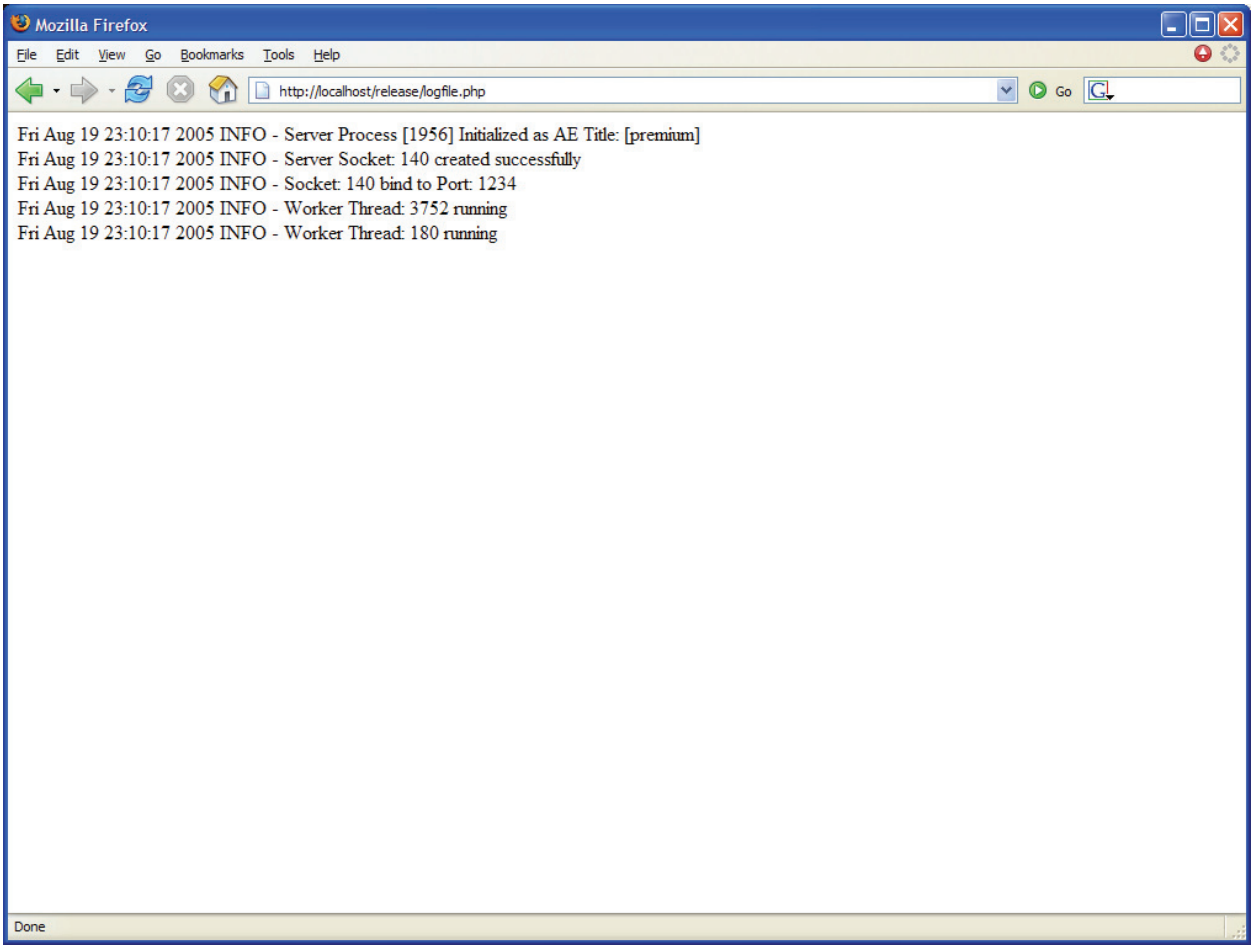
Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/release/logfile.php
Go
Fri Aug 19 23:10:17 2005 INFO - Server Process [1956] Initialized as AE Title: [premium]
Fri Aug 19 23:10:17 2005 INFO - Server Socket: 140 created successfully
Fri Aug 19 23:10:17 2005 INFO - Socket: 140 bind to Port: 1234
Fri Aug 19 23:10:17 2005 INFO - Worker Thread: 3752 running
Fri Aug 19 23:10:17 2005 INFO - Worker Thread: 180 running
Done

Figure 36 Today's Logfile Page

13.14.8 Upload Dicom Image

Users with **'Upload'** privilege enabled can click on this tab to upload Dicom Part-10 formatted raw images into the PacsOne Server database:

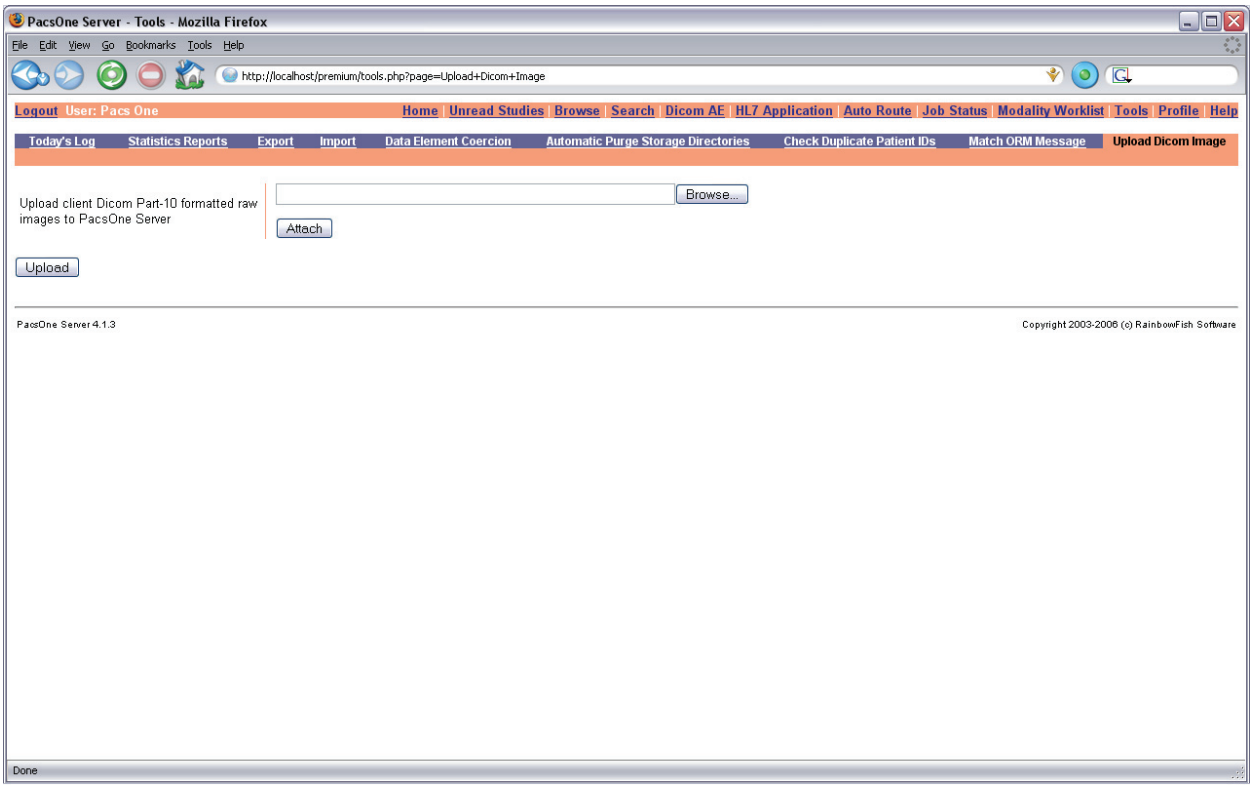
PacsOne Server - Tools - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/premium/tools.php?page=Upload+Dicom+Image
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Today's Log
Statistics Reports
Export
Import
Data Element Coercion
Automatic Purge Storage Directories
Check Duplicate Patient IDs
Match ORM Message
Upload Dicom Image
Upload client Dicom Part-10 formatted raw images to PacsOne Server
Browse...
Attach
Upload
PacsOne Server 4.1.3
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 37 Upload Dicom Image Page

13.14.9 Matching ORM Message (Optional)

This feature is available to users who have purchased the optional HL7 Message Listener module to enable PacsOne Server to receive and send HL7 messages. This tool can be used to select one of the received ORM (General Order) messages and match it with one or more received Dicom studies.

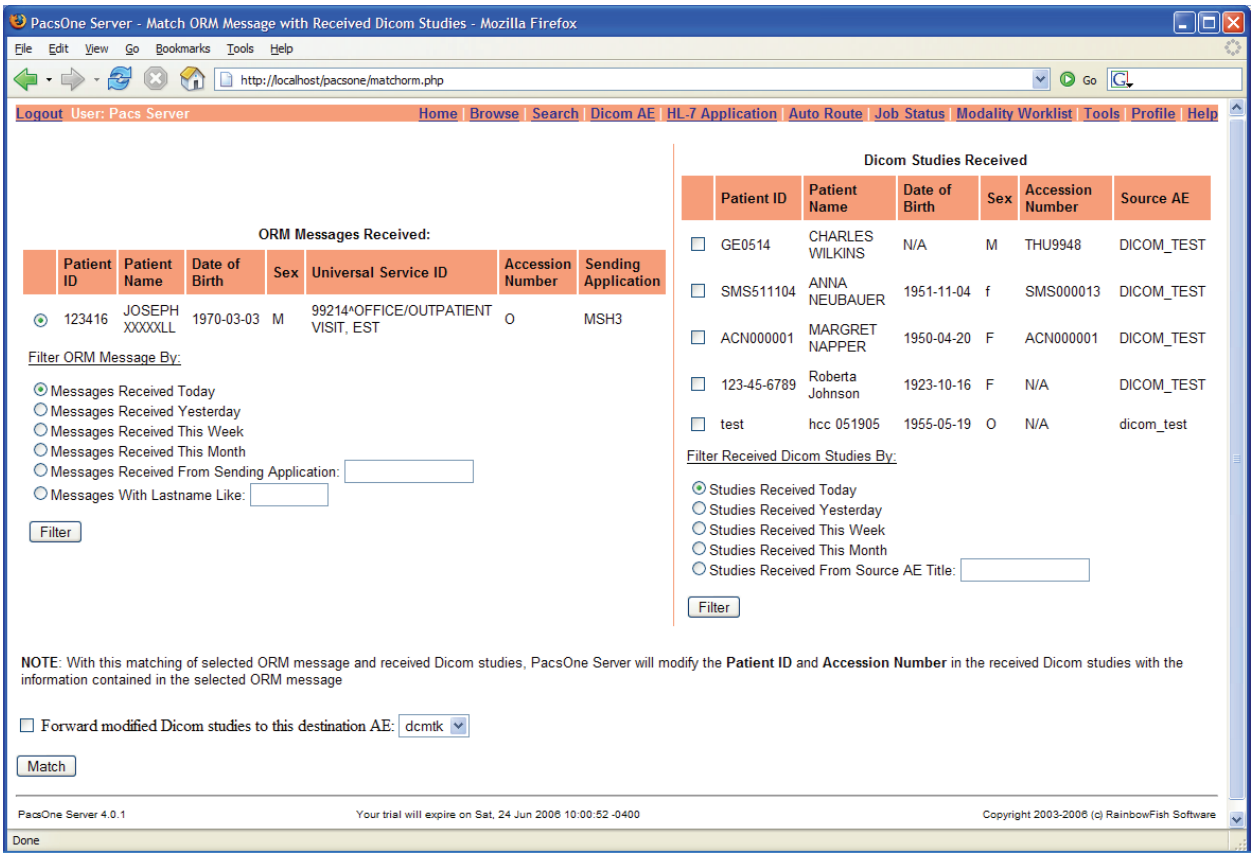
PacsOne Server - Match ORM Message with Received Dicom Studies - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/matchorm.php
Logout User: Pacs Server
Home | Browse | Search | Dicom AE | HL-7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
ORM Messages Received:
Patient ID | Patient Name | Date of Birth | Sex | Universal Service ID | Accession Number | Sending Application
123416 | JOSEPH XXXXXLL | 1970-03-03 | M | 99214^OFFICE/OUTPATIENT VISIT, EST | O | MSH3
Filter ORM Message By:
Messages Received Today
Messages Received Yesterday
Messages Received This Week
Messages Received This Month
Messages Received From Sending Application:
Messages With Lastname Like:
Filter
Dicom Studies Received
Patient ID | Patient Name | Date of Birth | Sex | Accession Number | Source AE
GE0514 | CHARLES WILKINS | N/A | M | THU9948 | DICOM_TEST
SMS511104 | ANNA NEUBAUER | 1951-11-04 | f | SMS000013 | DICOM_TEST
ACN000001 | MARGRET NAPPER | 1950-04-20 | F | ACN000001 | DICOM_TEST
123-45-6789 | Roberta Johnson | 1923-10-16 | F | N/A | DICOM_TEST
test | hcc 051905 | 1955-05-19 | O | N/A | dicom_test
Filter Received Dicom Studies By:
Studies Received Today
Studies Received Yesterday
Studies Received This Week
Studies Received This Month
Studies Received From Source AE Title:
Filter
NOTE: With this matching of selected ORM message and received Dicom studies, PacsOne Server will modify the Patient ID and Accession Number in the received Dicom studies with the information contained in the selected ORM message
Forward modified Dicom studies to this destination AE: dcmtk
Match
PacsOne Server 4.0.1
Your trial will expire on Sat, 24 Jun 2006 10:00:52 -0400
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 38 Matching ORM Message (optional)

After the user has matched the ORM message with one of more received Dicom studies, PacsOne Server will modify the **`Accession Number`** and **`Patient ID`** of the matching Dicom studies, with the information contained in the matching ORM message. Users can also optionally select a destination Dicom AE for PacsOne Server to send the modified Dicom studies, by selecting the destination AE from the drop-down list and checking the '**`Forward modified Dicom studies to this destination AE`**' checkbox.

13.14.10 Database Integrity Check

This feature will make PacsOne run an internal database integrity check where it will scan the IMAGE table of the PacsOne Server database, and verifies that for each record in the IMAGE table, the corresponding raw Dicom image file does exist and is not empty. PacsOne Server will report any missing or empty raw Dicom image file found from the integrity check.

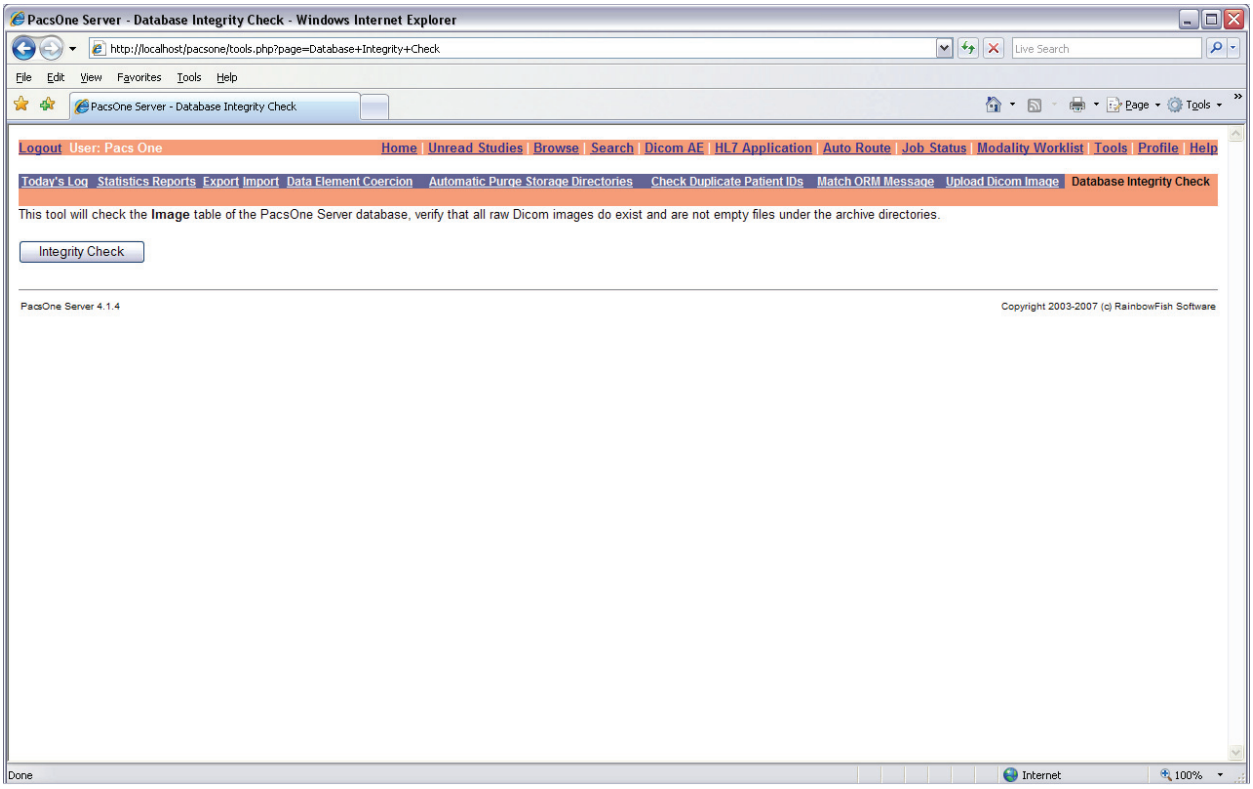
PacsOne Server - Database Integrity Check - Windows Internet Explorer
http://localhost/pacsone/tools.php?page=Database+Integrity+Check
File Edit View Favorites Tools Help
PacsOne Server - Database Integrity Check
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Today's Log Statistics Reports Export Import Data Element Coercion Automatic Purge Storage Directories Check Duplicate Patient IDs Match ORM Message Upload Dicom Image Database Integrity Check
This tool will check the Image table of the PacsOne Server database, verify that all raw Dicom images do exist and are not empty files under the archive directories.
Integrity Check
PacsOne Server 4.1.4
Copyright 2003-2007 (c) RainbowFish Software
Done
Internet
100%

Figure 39 Database Integrity Check

13.14.11 Import Worklist

This feature will make PacsOne import worklist records from a text file encoded in the Windows .INI format, and the imported worklist records will be inserted into the **WorkList** table in the PacsOne Server database. Then any Dicom Modality Worklist (DMWL) client can query PacsOne Server for the worklist data stored in the database.

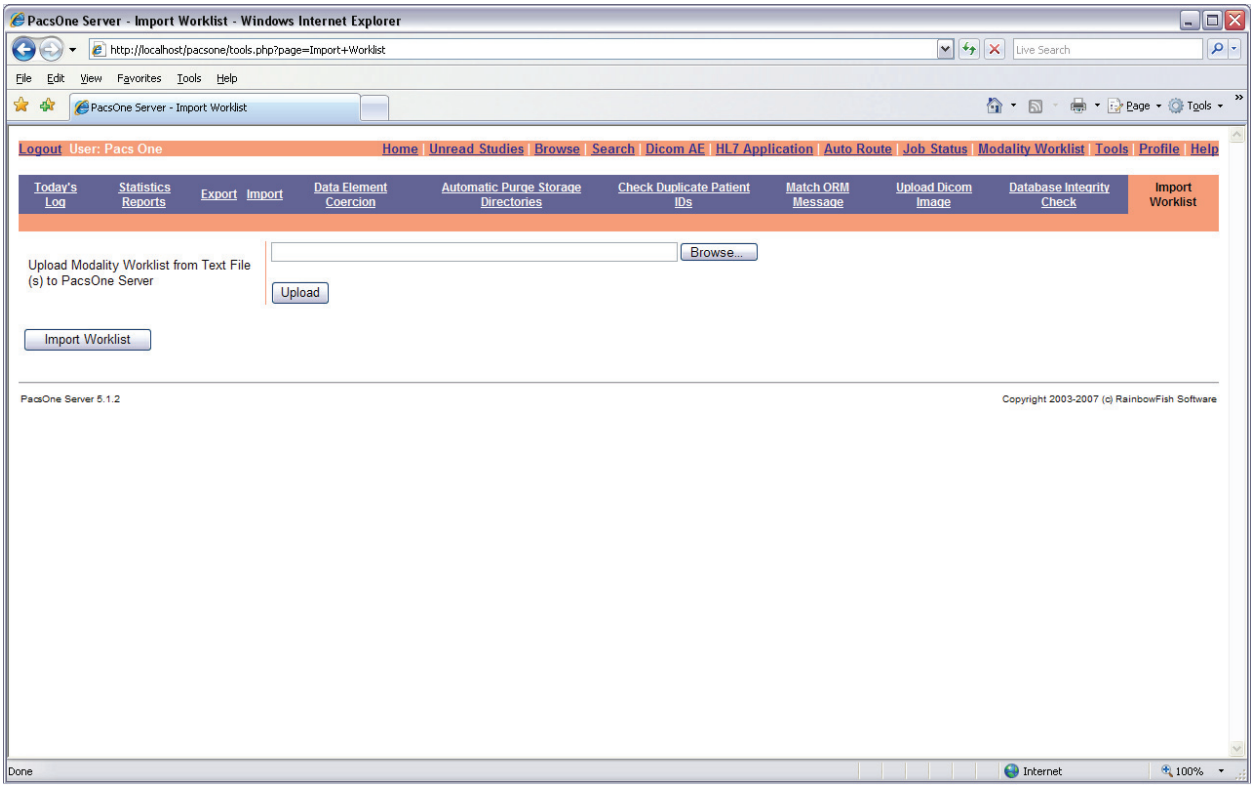
PacsOne Server - Import Worklist - Windows Internet Explorer
http://localhost/pacsone/tools.php?page=Import+Worklist
File Edit View Favorites Tools Help
PacsOne Server - Import Worklist
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Today's Log
Statistics Reports
Export Import
Data Element Coercion
Automatic Purge Storage Directories
Check Duplicate Patient IDs
Match ORM Message
Upload Dicom Image
Database Integrity Check
Import Worklist
Upload Modality Worklist from Text File (s) to PacsOne Server
Browse...
Upload
Import Worklist
PacsOne Server 5.1.2
Copyright 2003-2007 (c) RainbowFish Software
Done
Internet
100%

Figure 40 Import Worklist

The worklist text file should be formatted according to the following Windows .INI styles:

```
[RecordNum1]

Patient Name = Maximum 64 characters
Patient ID = Maximum 64 characters
Date of Birth = YYYY-MM-DD
Patient's Sex = Maximum 16 characters
Accession Number = Maximum 16 characters
Referring Physician's Name = Lastname^Firstname^Middlename^Prefix^Suffix (Maximum 64 characters)
Requesting Physician's Name = Lastname^Firstname^Middlename^Prefix^Suffix (Maximum 64 characters)

Requested Procedure ID = Maximum 16 characters
Requested Procedure Description = Maximum 64 characters
Requested Procedure Priority = Maximum 16 characters

Scheduled AE Station = Maximum 16 characters
Modality = Maximum 16 characters
Scheduled Start Date = YYYY-MM-DD
Scheduled Start Time = HH:mm
Performing Physician's Name = Lastname^Firstname^Middlename^Prefix^Suffix (Maximum 64 characters)
Scheduled Procedure ID = Maximum 16 characters
Scheduled Procedure Description = Maximum 64 characters
Scheduled Procedure Location = Maximum 16 characters
Scheduled Procedure Pre-Medication = Maximum 64 characters
Scheduled Procedure Contrast Agent = Maximum 64 characters

Procedure Code Value = Maximum 16 characters
Procedure Code Meaning = Maximum 64 characters
Procedure Code Scheme = Maximum 16 characters
Procedure Code Scheme Version = Maximum 16 characters

Protocol Code Value = Maximum 16 characters
Protocol Code Meaning = Maximum 64 characters
Protocol Code Scheme = Maximum 16 characters
Protocol Code Scheme Version = Maximum 16 characters
```

13.14.12 Live Monitor (for System Administrator only)

When logged-in as the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases), clicking on this tool will display a list of active Dicom connections (both incoming and outgoing) with PacsOne Server:

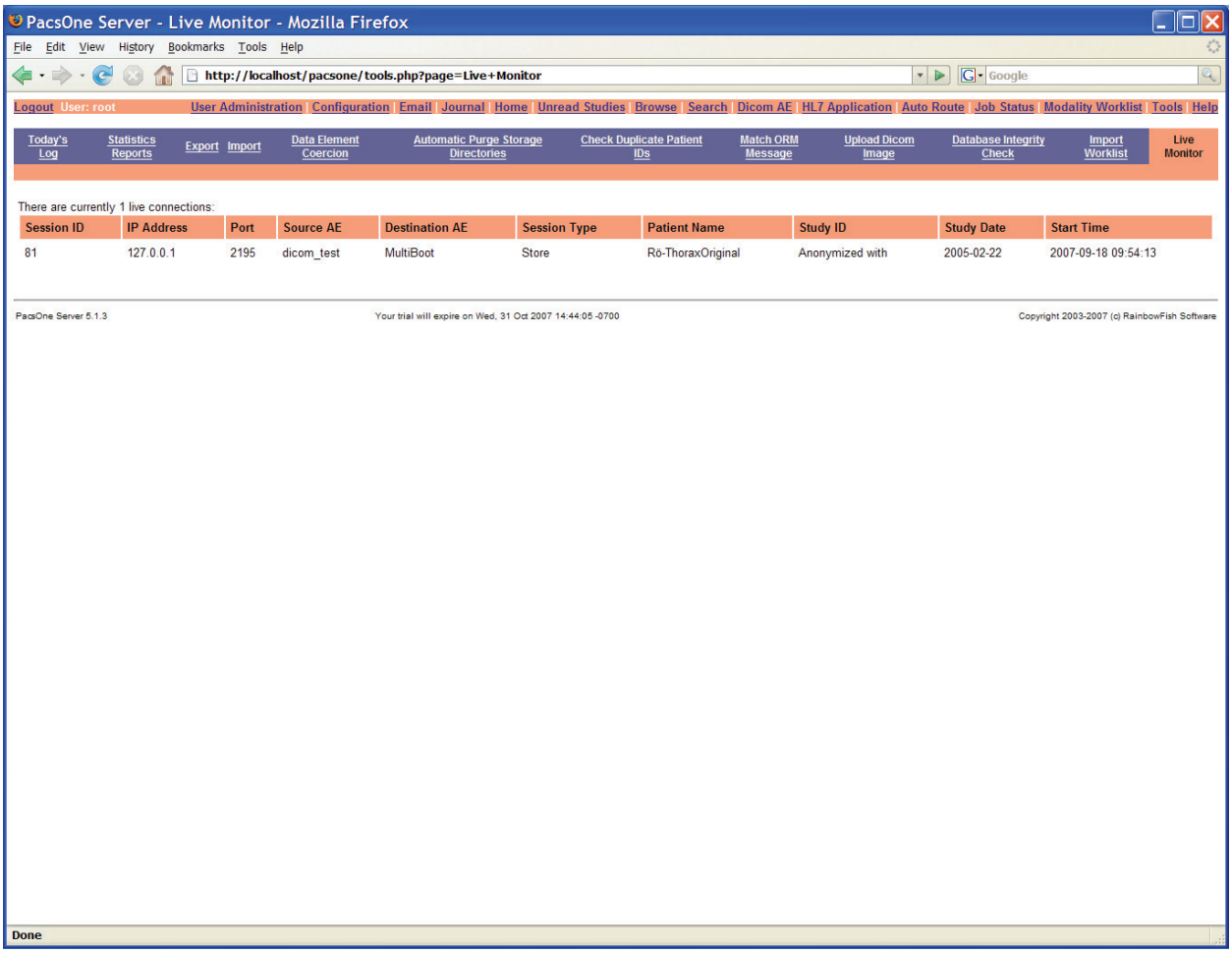

Figure 41 Live Monitor page

13.14.13 Patient Reconciliation

If the **Automatic Patient Reconciliation** feature is enabled by the Administrator ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) (described in Section 7), PacsOne Server will log automatic patient reconciliation events in the table shown below, which contains the following information for each event:

- `When` – Date and time of when the event took place
- `Patient ID` – Patient ID of the subject patient
- `Date of Birth` – DOB of the subject patient
- `Original Patient Name` – Original patient name before the event took place
- `Modified Patient Name` – Modified patient name after the event took place

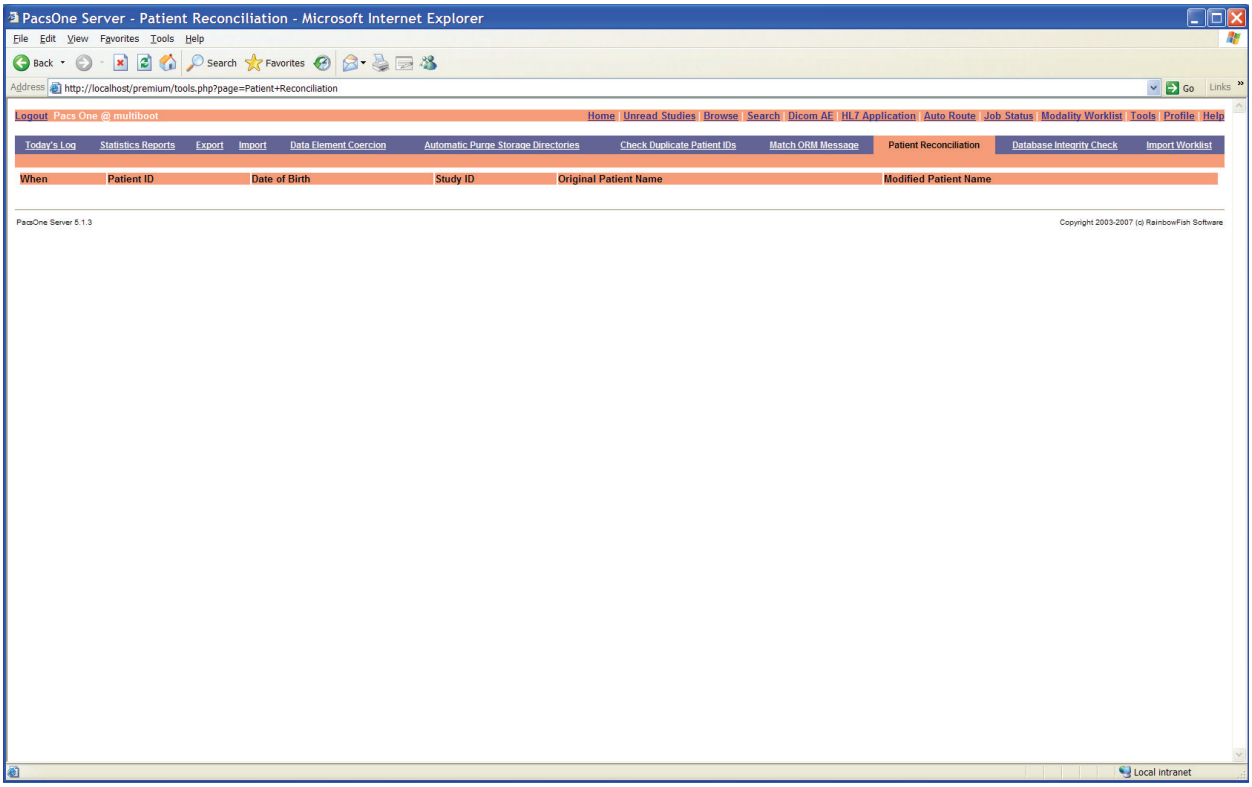
PacsOne Server - Patient Reconciliation - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost/premium/tools.php?page=Patient+Reconciliation
Go Links
Logout Pacs One @ multiboot
Home Unread Studies Browse Search Dicom AE HL7 Application Auto Route Job Status Modality Worklist Tools Profile Help
Today's Log Statistics Reports Export Import Data Element Coercion Automatic Purge Storage Directories Check Duplicate Patient IDs Match ORM Message Patient Reconciliation Database Integrity Check Import Worklist
When Patient ID Date of Birth Study ID Original Patient Name Modified Patient Name
PacsOne Server 5.1.3
Copyright 2003-2007 (c) RainbowFish Software
Local intranet

Figure 42 Patient Reconciliation Page

13.14.14 Anonymization Templates

For some client sites, e.g., clinical trials, users may want to anonymize all the patient demographics information, e.g., Patient Name, Patient ID, Date of Birth, etc., to meet the HIPAA Patient Privacy requirements. In such cases, users can pre-define a template with a set of specific syntax rules for PacsOne Server to anonymize the corresponding Dicom data elements in the received studies, by clicking on the **Tools->Anonymization Templates** page from the Main Menu to add or modify a template for anonymization of the received Dicom studies.

The following Dicom data elements can be defined in the Anonymization Template:

- **Patient Name** (0x00100010)
- **Patient ID** (0x00100020)
- **Date of Birth** (0x00100030)
- **Gender** (0x00100040)
- **Patient's Age** (0x00101010)
- **Study ID** (0x00200010)
- **Referring Physician's Name** (0x00080090)
- **Study Description** (0x00081030)
- **Series Description** (0x0008103E)

The following macros can be used to define the anonymization syntax for the Dicom **Patient ID** (0x00100020) data element:

- **$MD5$ –** PacsOne Server will anonymize the Dicom Patient ID data element with the MD-5 hash string of the original value. The resulting new Patient ID will be a fixed 32-char hex number string.
- **$STUDYUID$ –** PacsOne Server will replace the value of the Dicom Patient ID data element with the current value of the **Study Instance UID (0020,000D)** data element. NOTE: This anonymization implies that every anonymized study will be stored under a different Patient ID, which is the same as the Study Instance UID of that study.

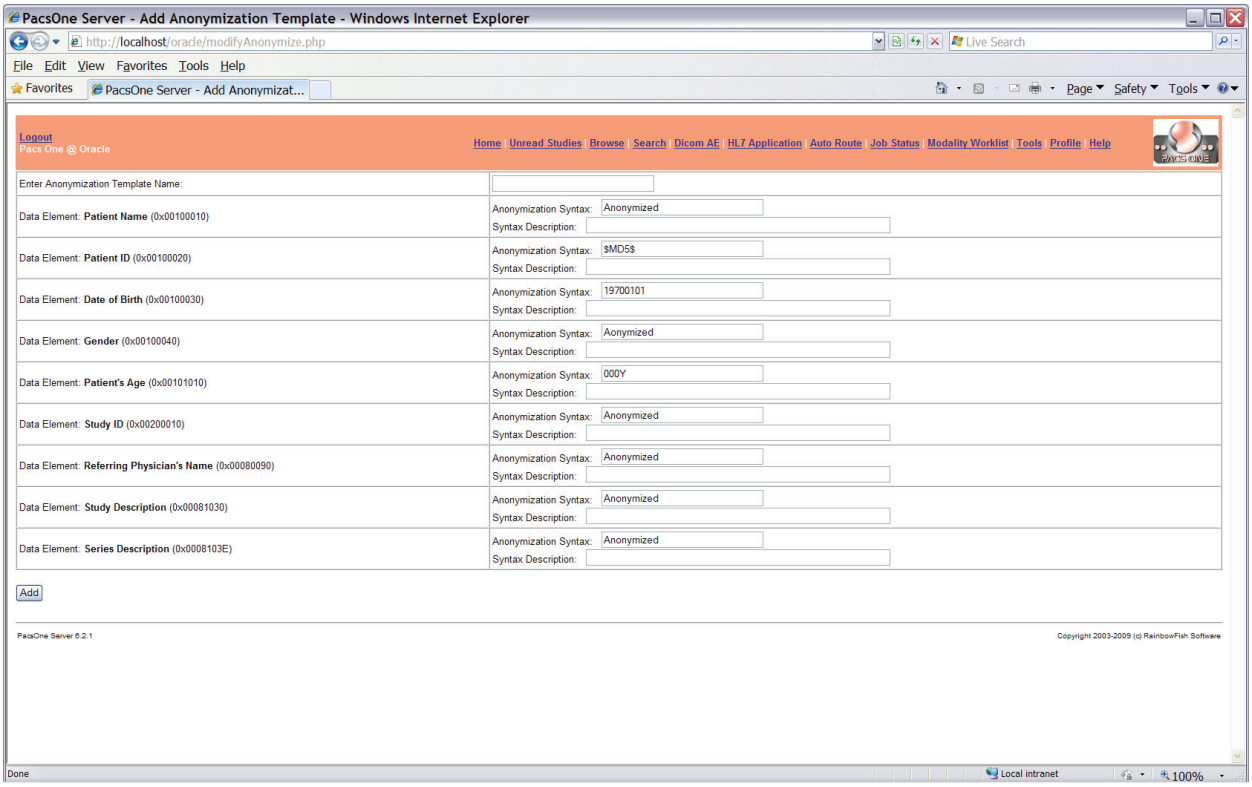

Figure 43 Anonymization Templates

Once the anonymization templates are defined, the users can select which template to use for anonymizing Dicom studies received from a source AE from the "**Edit**" menu of the Application Entity page (see Section 10.1 for more details).

13.14.15 Transcription Templates (Windows platforms only)

For Windows platforms, the Administrator can upload Microsoft Word document templates with pre-configured bookmarks (and/or with company letterhead) and assign this pre-defined template to a particular Source AE, so that when the web users are entering study notes for a subject Dicom study received from that Source AE, they can download this pre-defined Word document template with the pre-configured bookmarks automatically filled-in by PacsOne Server with the corresponding information from the Dicom study.

For example, the following bookmarks in the Anonymization Template Microsoft Word document can be pre-configured to be automatically filled-in by PacsOne Server with the corresponding information from the Dicom study:

- **PatientName** – This bookmark will be auto-filled with the `Patient Name (0x00100010)` information from the subject Dicom study

- **PatientID** – This bookmark will be auto-filled with the Patient ID (0x00100020) information from the subject Dicom study
- **DateOfBirth** – This bookmark will be auto-filled with the Date of Birth (0x00100030) information from the subject Dicom study
- **StudyDate** – This bookmark will be auto-filled with the Study Date (0x00200010) information from the subject Dicom study
- **ReferDoc** – This bookmark will be auto-filled with the Referring Physician's Name (0x00080090) information from the subject Dicom study

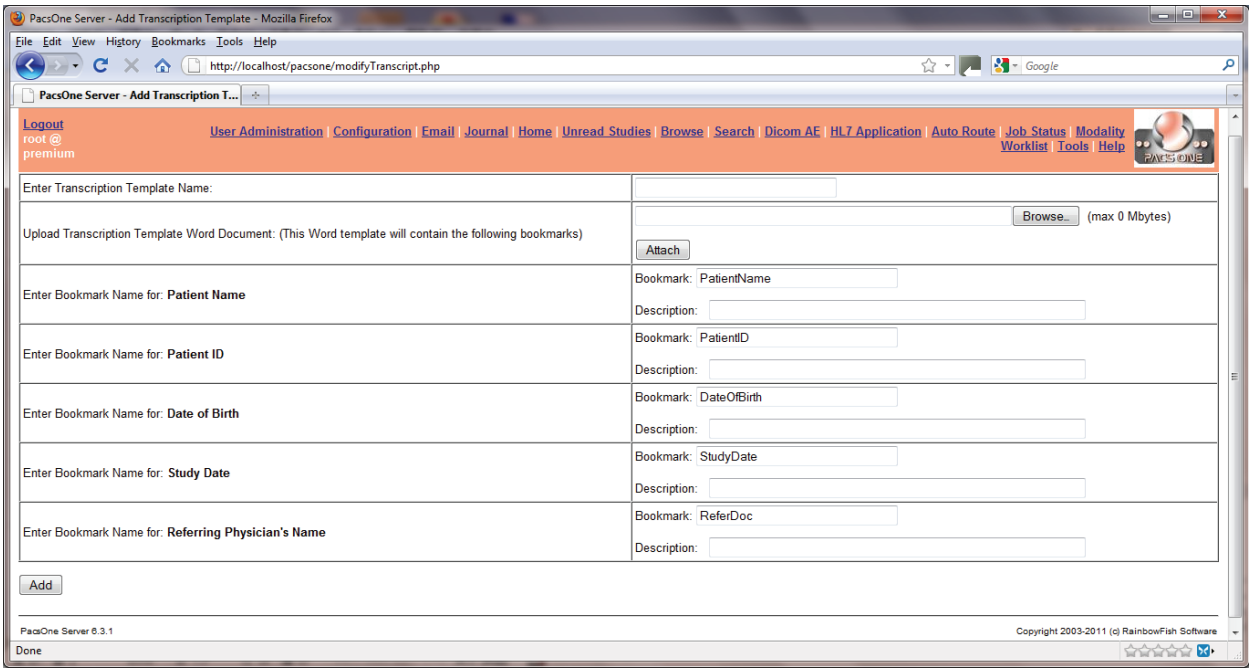
PacsOne Server - Add Transcription Template - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost/pacsone/modifyTranscript.php
PacsOne Server - Add Transcription T...
Logout
root @
premium
User Administration | Configuration | Email | Journal | Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Help
Enter Transcription Template Name:
Upload Transcription Template Word Document: (This Word template will contain the following bookmarks)
Browse...
(max 0 Mbytes)
Attach
Enter Bookmark Name for: Patient Name
Bookmark: PatientName
Description:
Enter Bookmark Name for: Patient ID
Bookmark: PatientID
Description:
Enter Bookmark Name for: Date of Birth
Bookmark: DateOfBirth
Description:
Enter Bookmark Name for: Study Date
Bookmark: StudyDate
Description:
Enter Bookmark Name for: Referring Physician's Name
Bookmark: ReferDoc
Description:
Add
PacsOne Server 6.3.1
Copyright 2003-2011 (c) RainbowFish Software
Done

Figure 44 Transcription Template (Windows platforms only)

13.14.16 Restart Service

For users with the **System Administration** privilege enabled, this page will be displayed to allow the System Administrators to restart the Dicom Server component as well as the optional HL7 Interface of PacsOne Server (if enabled). However, the <**Restart**> button will be available only if there is no active connection to/from PacsOne Server, i.e., if there is any active connection to/from PacsOne Server, the list of active connections will be displayed instead of the <**Restart**> button.

13.15 Profile Page

This page allows users to modify their profile information, which include:

- User's names, password and email address information
- Preferred import source directory
- Preferred import source media drive
- Preferred import destination folder
- Preferred export directory
- Whether or not to share notes about a subject Dicom study or image
- Customizable study view columns to be displayed in study list pages
- Customizable patient view columns to be displayed in patient list pages

- Number of records to be displayed in multi-page web user interface pages (default is 10)

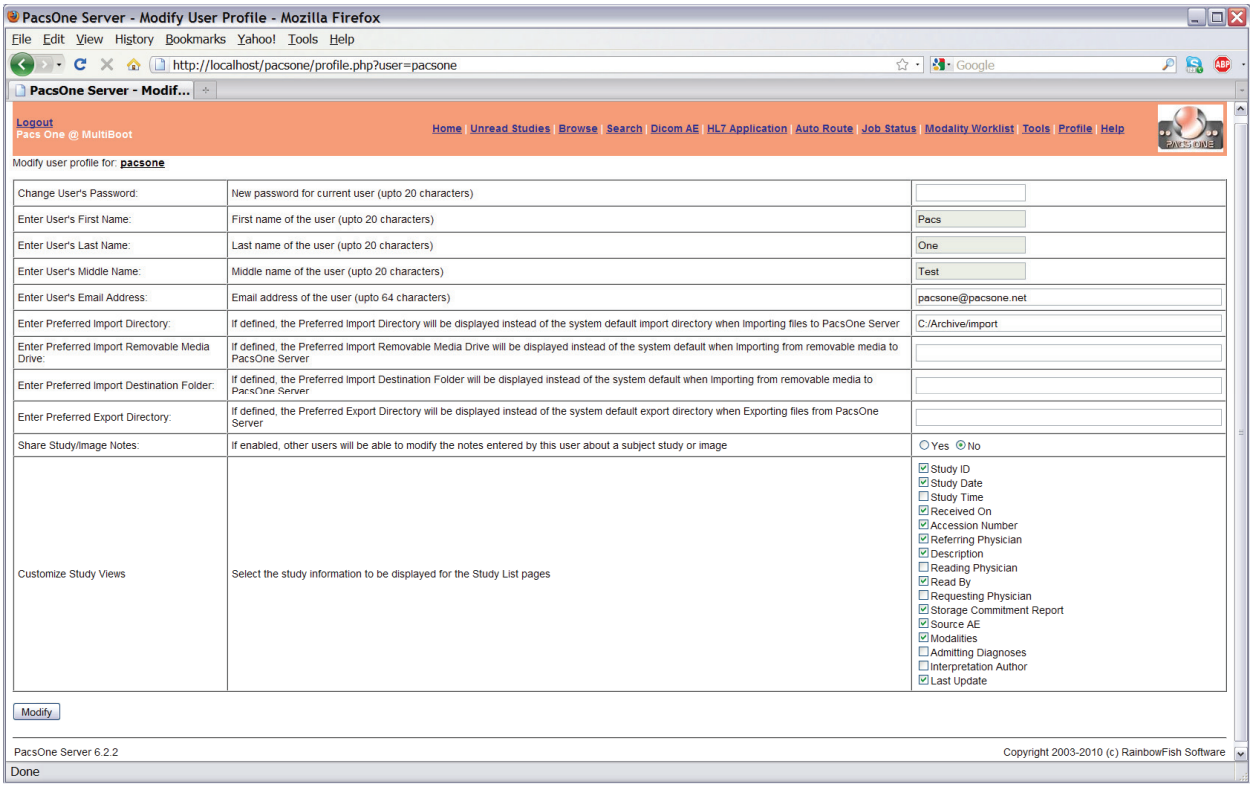
PacsOne Server - Modify User Profile - Mozilla Firefox
File Edit View History Bookmarks Yahoo! Tools Help
http://localhost/pacsone/profile.php?user=pacsone
PacsOne Server - Modif...
Logout
Pacs One @ MultiBoot
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Modify user profile for: pacsone
Change User's Password:
New password for current user (upto 20 characters)
Enter User's First Name:
First name of the user (upto 20 characters)
Pacs
Enter User's Last Name:
Last name of the user (upto 20 characters)
One
Enter User's Middle Name:
Middle name of the user (upto 20 characters)
Test
Enter User's Email Address:
Email address of the user (upto 64 characters)
pacsone@pacsone.net
Enter Preferred Import Directory:
If defined, the Preferred Import Directory will be displayed instead of the system default import directory when Importing files to PacsOne Server
C:/Archive/import
Enter Preferred Import Removable Media Drive:
If defined, the Preferred Import Removable Media Drive will be displayed instead of the system default when Importing from removable media to PacsOne Server
Enter Preferred Import Destination Folder:
If defined, the Preferred Import Destination Folder will be displayed instead of the system default when Importing from removable media to PacsOne Server
Enter Preferred Export Directory:
If defined, the Preferred Export Directory will be displayed instead of the system default export directory when Exporting files from PacsOne Server
Share Study/Image Notes:
If enabled, other users will be able to modify the notes entered by this user about a subject study or image
Yes No
Customize Study Views
Select the study information to be displayed for the Study List pages
Study ID
Study Date
Study Time
Received On
Accession Number
Referring Physician
Description
Reading Physician
Read By
Requesting Physician
Storage Commitment Report
Source AE
Modalities
Admitting Diagnoses
Interpretation Author
Last Update
Modify
PacsOne Server 6.2.2
Copyright 2003-2010 (c) RainbowFish Software
Done

Figure 45 User Profile Page

13.16 Modality Worklist Page

This page displays the Dicom Modality Worklist (DMWL) data that is currently stored in the PacsOne Server database, which contains the following tabbed pages:

- `Today's Worklist` – This page displays the worklist data for all procedures scheduled today
- `Yesterday's Worklist` – This page displays the worklist data for all procedures that were scheduled yesterday
- `This Week's Worklist` – This page displays the worklist data for all procedures scheduled this week
- `This Month's Worklist` – This page displays the worklist data for all procedures scheduled this month
- `Last Month's Worklist` – This page displays the worklist data for all procedures that were scheduled last month
- `Enter New Worklist` – This page allows the user to enter the Dicom Modality Worklist data manually into the database

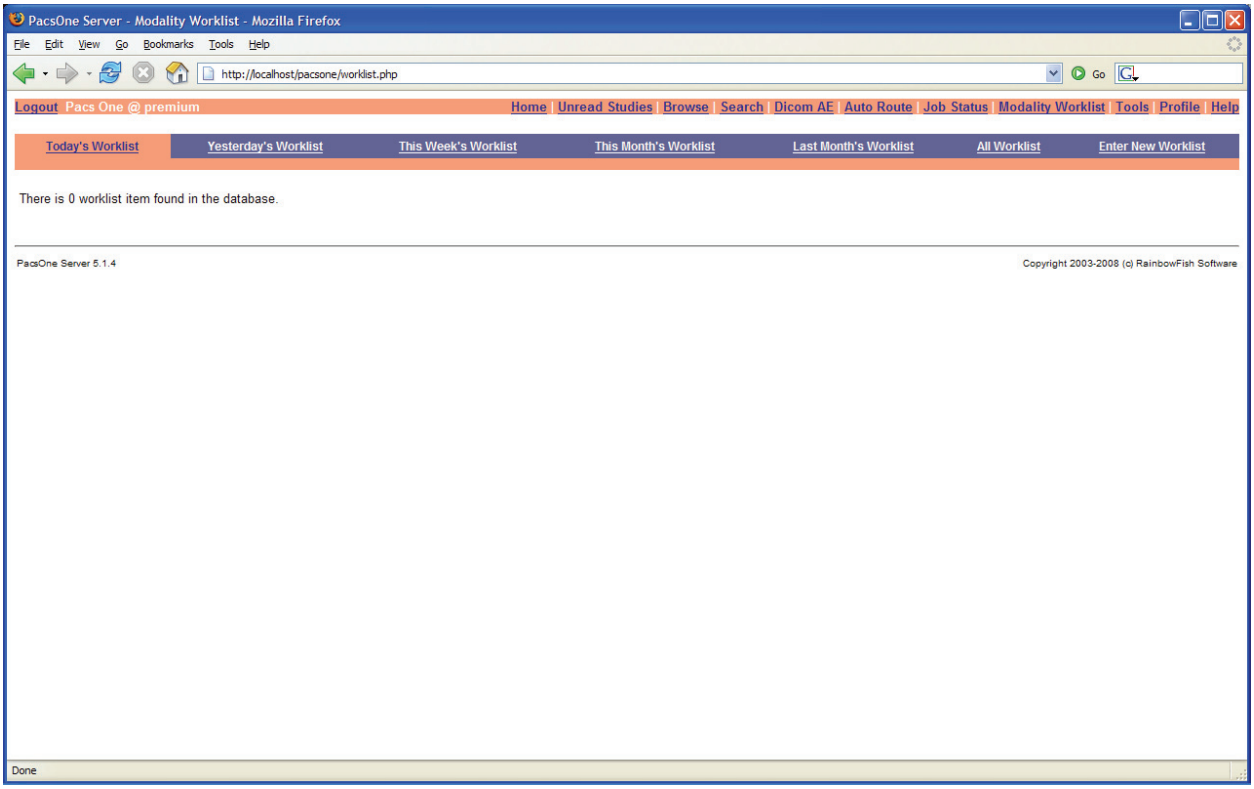
PacsOne Server - Modality Worklist - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/worklist.php
Go
Logout Pacs One @ premium
Home | Unread Studies | Browse | Search | Dicom AE | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Today's Worklist
Yesterday's Worklist
This Week's Worklist
This Month's Worklist
Last Month's Worklist
All Worklist
Enter New Worklist
There is 0 worklist item found in the database.
PacsOne Server 5.1.4
Copyright 2003-2008 (c) RainbowFish Software
Done

Figure 46 Modality Worklist Page

13.16.1 Enter New Worklist Page

This page allows the user to enter the Dicom Modality Worklist (DMWL) data manually into the database, so that they can be served by PacsOne Server to the DMWL querying clients such as the input modalities.

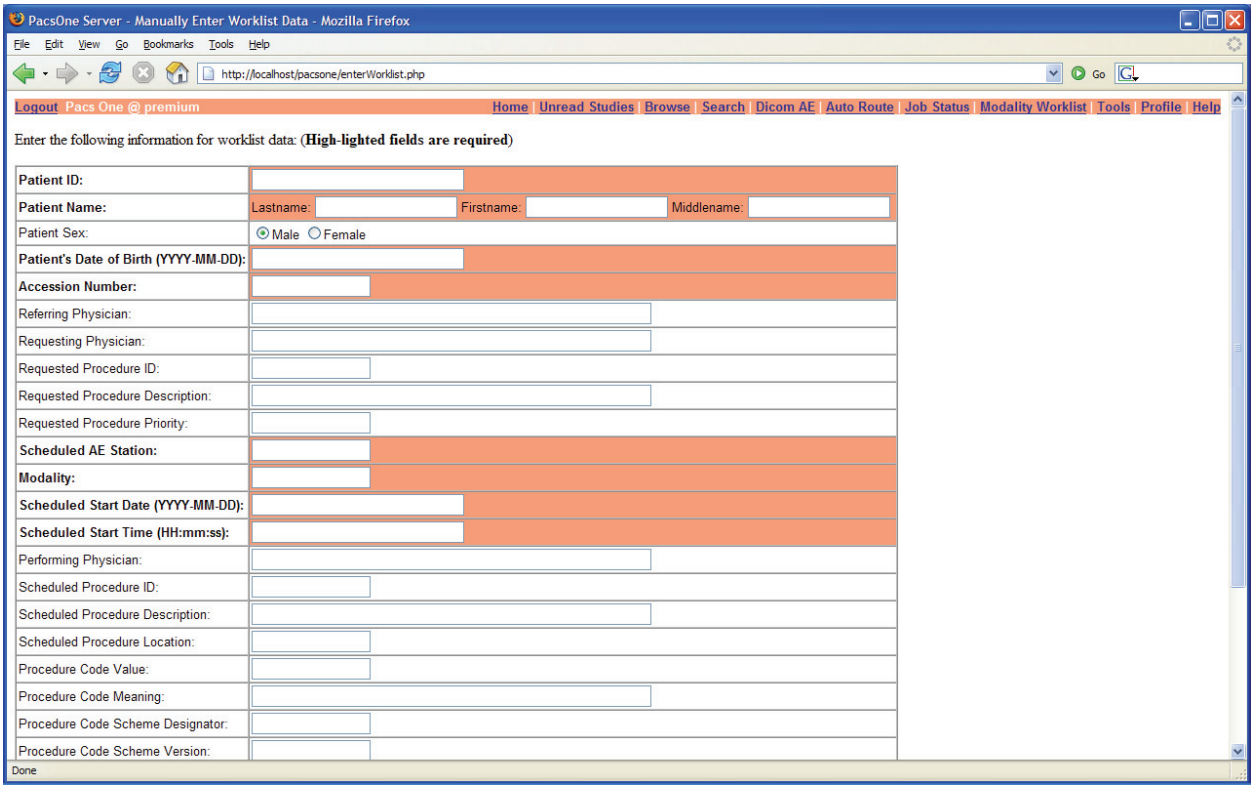

Figure 47 Enter New Worklist Page

14 Forwarding Images

When navigating through the patients, studies, series and images stored in the PacsOne database, if the current user has the '**Forward**' privilege enabled, a '**Forward**' button will be displayed to allow current user to forward the selected patients, studies or series to a remote destination C-STORE SCP application entity (AE):

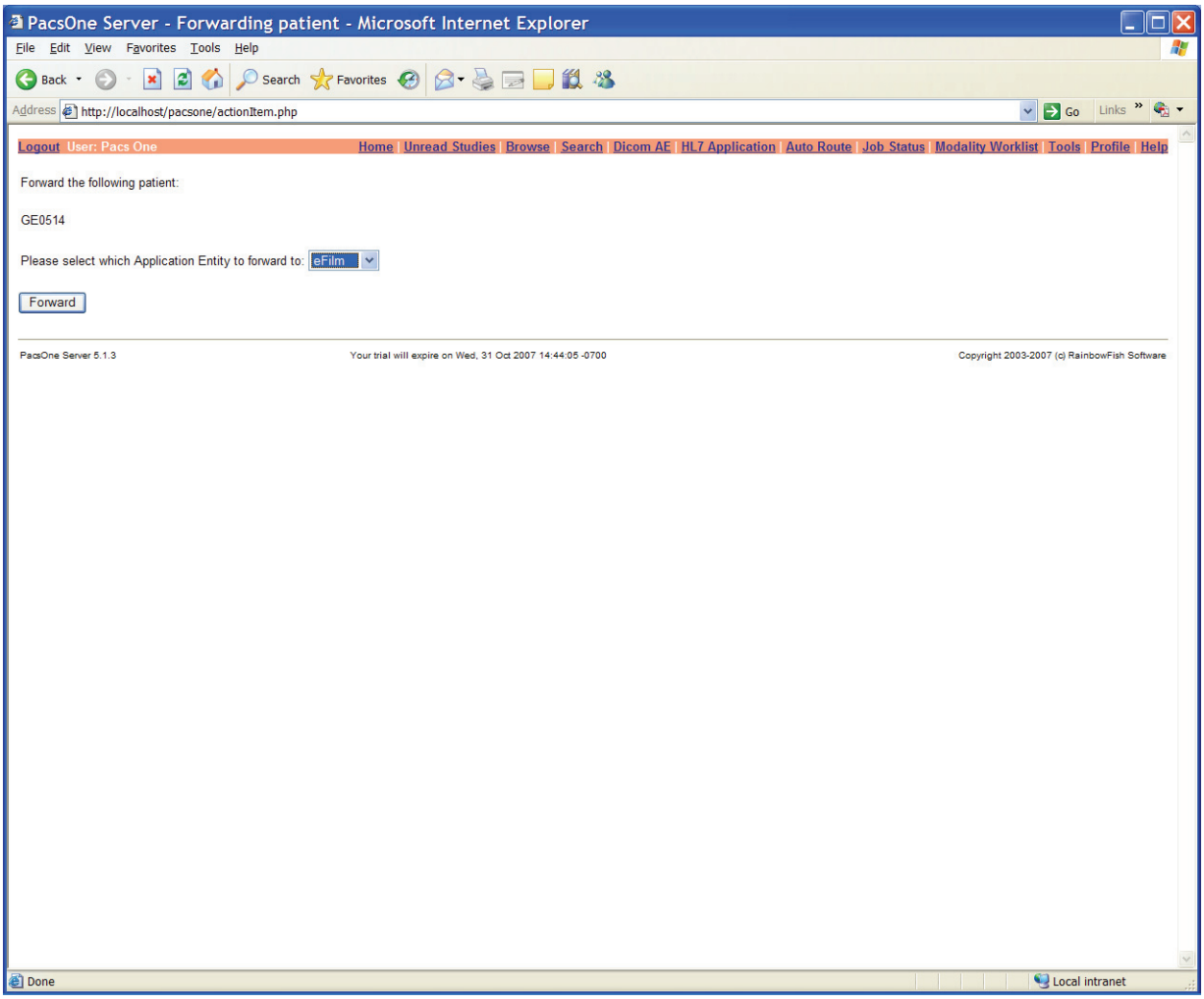
PacsOne Server - Forwarding patient - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost/pacsone/actionItem.php
Go Links
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Forward the following patient:
GE0514
Please select which Application Entity to forward to:
eFilm
Forward
PacsOne Server 5.1.3
Your trial will expire on Wed, 31 Oct 2007 14:44:05 -0700
Copyright 2003-2007 (c) RainbowFish Software
Done
Local intranet

Figure 48 Forwarding Images

Users can select the destination AE from the drop-down list of remote SCP's., which are defined in the `Application Entity Table` described in Section 10 above. Clicking on the '**`Forward`**' button will schedule a database job to forward the selected patient(s), study(s) or series to the selected destination AE. The scheduled database job will then be processed by the PacsOne DICOM Server component, where all stored images of the selected patient(s), study(s) or series are transmitted to the destination AE.

To find out if the selected patient(s), study(s) or series have been successfully forwarded to the destination AE, the user can click on the '`Job Status`' link in the `Main Menu` bar, which is described in detail in the Job Status Page below.

15 Post-Receive Image Compression

When delivering Dicom images to remote web browser (e.g., Java Applet viewers or Active-X plug-in), especially via a WAN connection, users often find the need for speeding up the image transfer between the PacsOne and the remote browsers. If this is the case, the Administrator can enable the Post-Receive Image Compression feature of PacsOne for each source AE, by selecting one of the Dicom compression transfer syntaxes from the list below:

- `JPEG Lossless Transfer Syntax` – If this value is selected, PacsOne Server will compress any received image using the Dicom JPEG Lossless Compression (Selection Value 1, Process 14) transfer syntax (UID 1.2.840.10008.1.2.4.70), and will save the compression image with the "`.ls`" filename extension.
- `JPEG Lossy Transfer Syntax` – If this value is selected, PacsOne Server will compress any received image using the Dicom JPEG Baseline Lossy Compression transfer syntax (UID 1.2.840.10008.1.2.4.50) for 8-bit images, and the Dicom JPEG Extended Lossy Compression transfer syntax (UID 1.2.840.10008.1.2.4.51) for 12-bit images. Both types of compressed images will be saved with the "`.ly`" filename extension. The image quality of the lossy compression is controlled by the following setting for each source AE if this transfer syntax is selected:

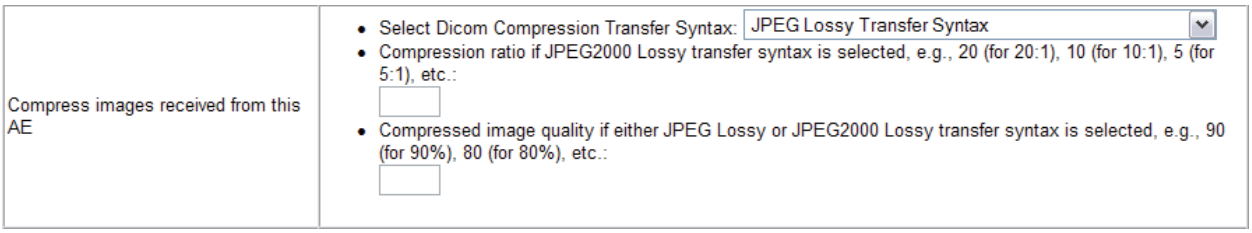
Compress images received from this AE
Select Dicom Compression Transfer Syntax: JPEG Lossy Transfer Syntax
Compression ratio if JPEG2000 Lossy transfer syntax is selected, e.g., 20 (for 20:1), 10 (for 10:1), 5 (for 5:1), etc.:
Compressed image quality if either JPEG Lossy or JPEG2000 Lossy transfer syntax is selected, e.g., 90 (for 90%), 80 (for 80%), etc.:

Figure 49 Compression Setting for JPEG Lossy Transfer Syntax

The quality can be set to `1` (worst quality, best compression ratio) to `100` (best quality, least compression ratio). The default value of `90` (percent) will be used if the above setting is absent.

- `Runtime Length Encoding (RLE) Transfer Syntax` – If this value is selected, PacsOne Server will compress any received image using the Dicom RLE compression transfer syntax (UID 1.2.840.10008.1.2.5), and will save the compression image with the "`.rle`" filename extension.
- `JPEG2000 Part-1 Lossless Only Transfer Syntax` – If this value is selected, PacsOne Server will compress any received image using the Dicom JPEG2000 Part-1 Lossless Only transfer syntax (UID 1.2.840.10008.1.2.4.90), and will save the compression image with the "`.j2k`" filename extension.
- `JPEG2000 Part-1 Lossless Or Lossy Transfer Syntax` – If this value is selected, PacsOne Server will compress any received image using the Dicom JPEG2000 Part-1 Lossless Or Lossy transfer syntax (UID 1.2.840.10008.1.2.4.91), and will save the compression image with the "`.j2k`" filename extension. The compression ratio or image quality of the JPEG2000 lossy compression are controlled by the following settings for each source AE if this transfer syntax is selected:

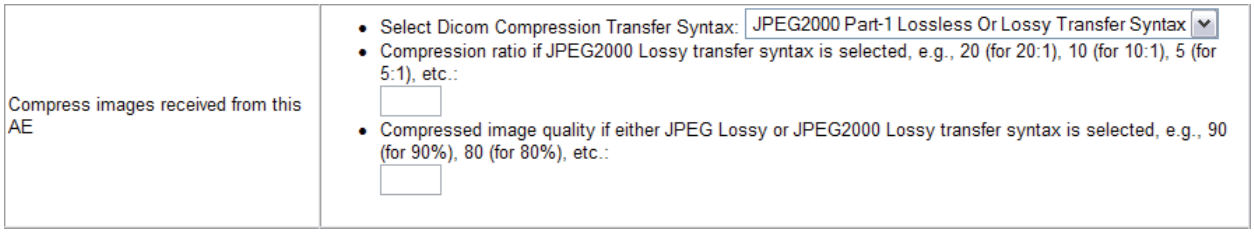
Compress images received from this AE
Select Dicom Compression Transfer Syntax: JPEG2000 Part-1 Lossless Or Lossy Transfer Syntax
Compression ratio if JPEG2000 Lossy transfer syntax is selected, e.g., 20 (for 20:1), 10 (for 10:1), 5 (for 5:1), etc.:
Compressed image quality if either JPEG Lossy or JPEG2000 Lossy transfer syntax is selected, e.g., 90 (for 90%), 80 (for 80%), etc.:

Figure 50 Compression Setting for JPEG2000 Part-1 Lossless or Lossy Transfer Syntax

The compression ratio can be set to 20 (20:1), 10 (10:1), 5 (5:1), etc. with higher compression ratio generally leading to lesser image quality. The image quality can be set to `1` (worst quality, best compression ratio) to `100` (best quality, least compression ratio), and the default quality is `90` (percent).

With the above Post-Receive Image Compression feature enabled, PacsOne Server will first check if any of the compressed images is available when delivering Dicom images to the web browsers, and will prefer the compressed images over the original images when transferring the images to the remote browsers. By default, PacsOne Server uses the Lossless mode of the JPEG2000 Lossless or Lossy compression if both of the above Registry settings are absent.

16 Automatic Routing

16.1 Dicom Image Routing

In addition to forwarding patient(s), study(s) or series manually from the PacsOne web user interface, users can define automatic routing table entries to forward images automatically based on the following criteria:

- `Source AE Title` – This is the AE title from where the images are received. If the **`Route By Source AE Title`** option is selected and an image is received from the matching source AE title, PacsOne Server will route the received image to the defined destination AE automatically, according to the routing schedule defined below.
- `Key Attribute Tag` – Currently the following list of Dicom attributes are supported:

  - `Institution Name - (0008,0080)`
  - `Referring Physician Name - (0008,0090)`
  - `Patient ID - (0010,0020)`
  - `Protocol Name - (0018,1030)`
  - `Performing Physician's Name (0008,1050)`
  - `Reading Physician's Name (0008,1060)`
  - `Operator's Name (0008,1070)`
  - `Study Description (0008,1030)`
  - `Series Description (0008,103E)`
  - `Accession Number (0008,0050)`
  - `Modality (0008,0060)`
  - `Modalities In Study (0008,0061)`

  If the **`Route By Key Attribute`** option is selected, users can define a **Key Matching Pattern** string (may include wild-card characters including '*' and '?') to match against received image attribute tags. If the key attribute tag in the received image matches with the specified matching pattern string, PacsOne Server will route the received image to the defined destination AE automatically, according to the routing schedule defined below.
- `By Applying the Logical AND Operator (&&) to Both Criteria Above` – If this option is selected, PacsOne Server will apply both the **`Source AE Title`** and **`Key Attribute Tag`** criteria using the logical AND (&&) operator, i.e., the received images must match **both** the defined **`Source AE Title`** and **`Key Attribute Tag`** pattern before they can be forwarded to the defined Destination AE.
- `By Applying the Advanced Logical Expressions` – Users can configure advanced logical expressions for the automatic routing rule, which consists of one or more key matching patterns against the routing key attributes above, as well as logical operators such as **`AND`** (**`&&`**), **`OR`** (`||`). Uses can also specify the priority for applying multiple logical expressions by using the round brackets "`()`", i.e., logical expressions enclosed within the round brackets will be applied first, before those expressions outside of the round brackets. For more information about this feature, please refer to the advanced logical expression example below.
- `Destination AE Title` – This is the AE title where the images will be sent.
- `Copy To Destination Folder` – If this option is selected, PacsOne Server will copy received images into the specified destination folder, instead of forwarding them to a destination AE.
- `Hourly Schedule` – Automatic forwarding schedule by the 24-hour clock, which can be either '**`Immediately`**', a **`[From,To]`** spread window, a specified 24-hour clock interval, or a **`[From,To]`** immediate-filter window.
- `Weekly Schedule` – Automatic forwarding schedule by the 7-weekday daily schedule. The weekly schedule is combined with the hourly schedule above to determine when or if PacsOne should forward the received images.
- `Priority` – The higher priority an Automatic Routing Rule is defined, the higher priority the resulting automatic routing jobs will be assigned. So if there are multiple automatic routing rules defined with the same

delivery schedule, the routing jobs resulting from the highest-priority rule will be processed before those jobs resulting from the lower-priority rules. Default priority is `0` for normal or low priority rules.

- `Purge After Routing` – Whether or not PacsOne Server should purge the received images automatically after they have been routed successfully to the destination AE.
- `Forward Existing [n] Oldest Studies To Destination AE` – If this checkbox is selected, PacsOne Server will also forward the [**n**] existing oldest studies to the destination AE, in addition to the newly received study. If a negative number (e.g., "`-1`") is entered, PacsOne Server will forward the [**n**] existing newest/latest studies to the destination AE, in addition to the newly received study.
- `Wait [n] minutes for all instances of the study to be received`, and forward the entire study instead of individual images – If this checkbox is selected, PacsOne Server will wait the specified **[n]** minutes for all images of the study to be received, then forward the entire study via a single Dicom association to the destination AE and transfer all images of the study.
- `Wait [n] minutes for all instances of the series to be received`, and forward the entire series instead of individual images – If this checkbox is selected, PacsOne Server will wait the specified **[n]** minutes for all images of the series to be received, then forward the entire series via a single Dicom association to the destination AE and transfer all images of the series.
- `Retry Interval for retrying failed automatic routing jobs` – This time interval (in hours) specify the amount of delay PacsOne Server will wait before attempting to retry a failed job. The default value is 0, which means PacsOne Server will attempt to retry any failed job as soon as it fails.
- `Do not use the AE Title assigned to PacsOne Server` – If this checkbox is selected, PacsOne Server will use either the Original/Source AE Title from the source AE, or the User-specified AE Title (instead of using the AE Title configured for PacsOne Server) when sending images to the destination AE.

When specifying the AE titles for automatic routing entries, the source and destination AE titles are used as keys to the routing table, which implies that one source AE can have one (uni-cast) or more (multi-cast) destination AE (s) associated with the routing entry. In other words, received images from the same source AE can be forwarded to multiple destinations AE (s) if there are more than one destination AE (s) defined for the source AE.

- If '**Immediately**' is specified as the schedule for the automatic routing table, then images will be forwarded to the destination AE (s) as soon as they are received.
- If a '**From**' and '**To**' Spread Window is specified as the schedule for the automatic routing table, then PacsOne will forward any received images to the destination AE (s), by choosing an hourly schedule that is evenly distributed across the specified [**From**, **To**] Spread Window. This scheduling option is useful when users want to spread the automatic routing jobs evenly across the [**From**, **To**] window, thus avoid making any hour particularly busy with too many routing jobs.
- If a fixed 24-hour clock interval is used, then the received images will be forwarded at the specified hour. For example, if the schedule is set to 9:00 P.M., then the received images will not be forwarded to the destination AE (s) until the local time is 9:00 P.M. If there are any images received between 9:00 P.M. and 9:59 P.M., they will be forwarded immediately, and images received after 9:59 P.M. will be forwarded the next day at 9:00 P.M.
- If a '**From**' and '**To**' Immediate-Filter Window is specified as the schedule for the automatic routing table, then images will be forwarded to the destination AE (s) immediately if the local time is within the specified [**From**, **To**] Immediate-Filter Window.

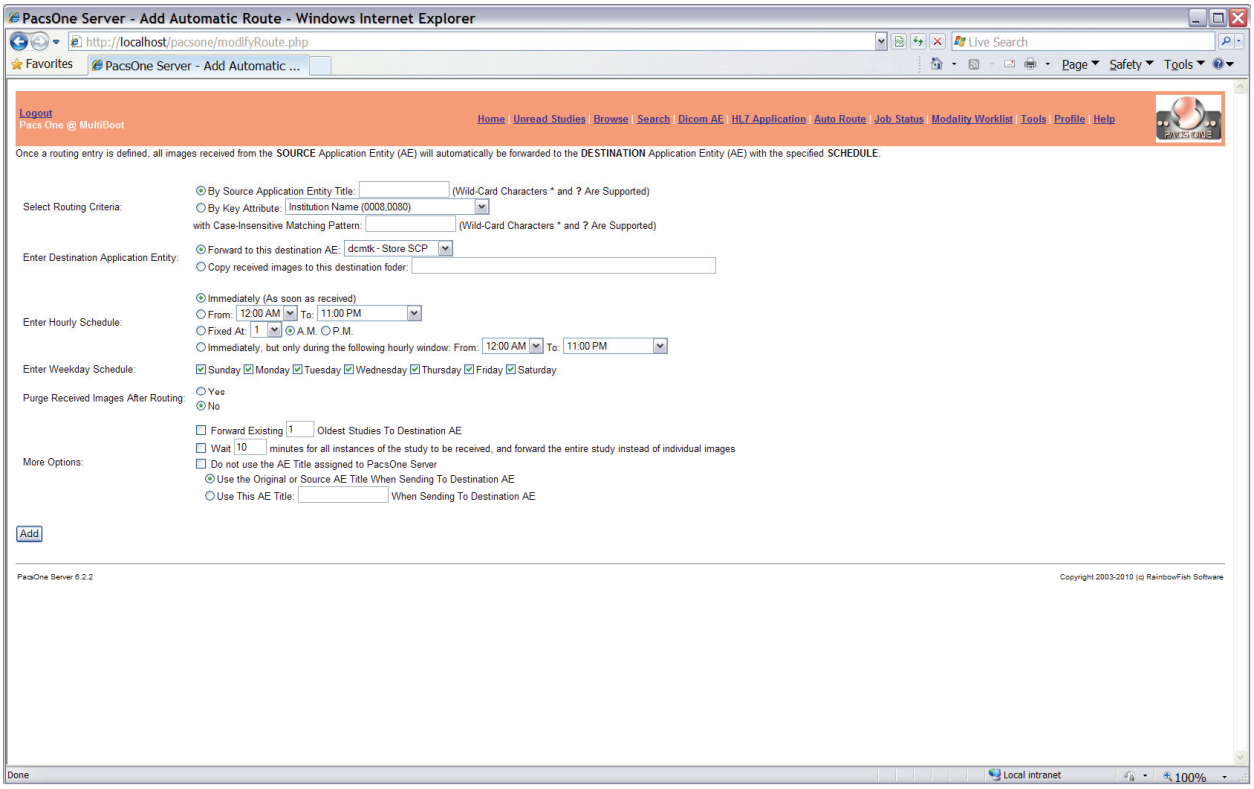
PacsOne Server - Add Automatic Route - Windows Internet Explorer
http://localhost/pacsone/modifyRoute.php
Logout
Pacs One @ MultiBoot
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Once a routing entry is defined, all images received from the SOURCE Application Entity (AE) will automatically be forwarded to the DESTINATION Application Entity (AE) with the specified SCHEDULE.
Select Routing Criteria:
By Source Application Entity Title:
(Wild-Card Characters * and ? Are Supported)
By Key Attribute: Institution Name (0008,0080)
with Case-Insensitive Matching Pattern:
(Wild-Card Characters * and ? Are Supported)
Enter Destination Application Entity:
Forward to this destination AE: dcmtk - Store SCP
Copy received images to this destination foder:
Enter Hourly Schedule:
Immediately (As soon as received)
From: 12:00 AM To: 11:00 PM
Fixed At: 1 A.M. P.M.
Immediately, but only during the following hourly window: From: 12:00 AM To: 11:00 PM
Enter Weekday Schedule:
Sunday Monday Tuesday Wednesday Thursday Friday Saturday
Purge Received Images After Routing:
Yes
No
More Options:
Forward Existing 1 Oldest Studies To Destination AE
Wait 10 minutes for all instances of the study to be received, and forward the entire study instead of individual images
Do not use the AE Title assigned to PacsOne Server
Use the Original or Source AE Title When Sending To Destination AE
Use This AE Title: When Sending To Destination AE
Add
PacsOne Server 6.2.2
Copyright 2003-2010 (c) RainbowFish Software
Done
Local intranet
100%

Figure 51 Automatic Dicom Image Routing

Example routing rules:

- `Route By Source AE Title` – Users can click on the **`By Source Application Entity`** option and enter the following parameters:

  ```
  Source AE Title       -    Scanner
  Destination AE Title  -    eFilm
  Hourly Schedule       -    Immediately
  Weekly Schedule       -    Any day
  Auto Purge            -    No
  ```

  With the above routing rule, all images received from the AE "`Scanner`" will be automatically routed to AE "`eFilm`" as soon as they are received. The received images will be kept in PacsOne database after they are routed to the destination AE "eFilm".

- `Route By Key Attribute` – Users can click on the **`By Key Attribute`** option and enter the following parameters:

  ```
  Key Attribute Tag     -    Referring Physician's Name (0008,0090)
  Matching Pattern      -    John D*
  Destination AE Title  -    DCMTK
  Hourly Schedule       -    1:00 A.M.
  Weekly Schedule       -    Tuesday
  Auto Purge            -    Yes
  ```

  With the above routing rule, all images received with the referring physician name such as "`John Doe`" or "`John David`" will be automatically routed to AE "`DCMTK`" at 1:00 A.M local time on Tuesdays. (However, received images with referring physician name such as "`Dr. John Doe`" or "`Mr. John David`" do not

match with the defined routing pattern string and therefore will not be routed.) The received images will be purged after they have been routed successfully to the destination AE "DCMTK".

- `Route By Advanced Logical Expressions` – Users can use the following button tools to build the advance logical expression pattern string:

  - `Left Round Bracket` – Clicking on this button will append "**(**" to the logical expression pattern.
  - `Right Round Bracket` – Clicking on this button will append "**)** " to the logical expression pattern.
  - `AND (&&)` – Clicking on this button will append " && " to the logical expression pattern.
  - `OR (||)` – Clicking on this button will append " **||** " to the logical expression pattern**.**
  - `Key Attribute Tag` – Supported routing key Dicom attribute tag, e.g. , Referring Physician's Name (0008,0090).
  - `Matching Pattern` – Pattern string to be matched with the current value of the key attribute above. Wild-card characters such as '*****' and '**?**' are supported. If the pattern is prefixed by the '**!**' character, then the logical NOT ('**!**') operator will be applied for the pattern string defined for this Dicom key attribute.
  - `Append` – Clicking on this button will append the "`%`**$tag**=**$pattern**`%`" string above to the current logical expression, where **$tag** is the Dicom key attribute tag and **$pattern** is the matching pattern specified above.
  - `Reset` – Clicking on this button will clear or reset the current logical expression pattern string.

  For example, the logical expression "`(%00080090=smith*% OR %00100020=12345*) AND %00080060=ct%`" will match the received Dicom studies with the following criteria:

  - Any Referring Physician's Name (0008,0090) beginning with "`smith`" or Patient ID (0010,0020) beginning with "`12345`", **AND**
  - Modality (0008,0060) is CT

  So a received Dicom CT study with the Referring Physician's Name of "`Smith^John`" would match with this routing rule, while a MR study with the Patient ID of "`123456`" would not match.

To find out if the statuses of the automatically routed images and check whether they have been successfully sent to the destination AE(s), the user must login as the Administrator/Super-user account ('**root**' for MySQL or '**SYSTEM**' for Oracle databases) and click on the '`Job Status`' link in the `Main Menu` bar. This is because the automatic routing jobs are internal System level properties and do not belong to any particular user, therefore they should be maintained only by the system administrator.

If for any reason (e.g., no receiving application is accepting images at the destination AE) the automatically routed images cannot be delivered successfully, PacsOne Server will retry up to a maximum of three (default) attempts to deliver the failed images to the destination AE. This **Maximum Retries** parameter is configurable by modifying the following Windows Registry value:

`HKEY_LOCAL_MACHINE\Software\Rainbowfish Software\PacsOne\{`*AETITLE*`}\MaximumRetries`

Where:

{*AETITLE*} is the Application Entity Title you have assigned for PacsOne Server during installation.

16.2 HL7 Message Routing (optional)

If the HL7 Message Listener option is installed, users can define automatic routing table entries to forward received HL7 messages automatically based on the following criteria:

- Source Application Name – This is the HL7 application from where the messages are received. If the **Route By Source Application Name** option is selected and a message is received with the matching "**Sending Application**" field in the **MSH** Message Header, PacsOne Server will route the received messages to the defined destination HL7 application automatically, based to the routing schedule defined below.
- Key in Message Header – Currently the following keys are supported:

  - **Message Type**
  - **Receiving Application**
  - **Receiving Facility**
  - **Sending Facility**

  If this option is selected, users can define a **Key Matching Pattern** string (may include wild-card characters such as '*' or '?') to match against the **MSH** message header in the received HL7 messages. If the key attribute in the received messages matches with the specified matching pattern, PacsOne Server will route the received messages to the defined destination HL7 application automatically, according to the routing schedule defined below.
- Destination Application – This is the destination HL7 application where the received messages will be sent.
- Schedule – Automatic forwarding schedule, which can be either '**Immediately**', a **[From,To]** 24-hour clock window, or a specified 24-hour clock interval:

  - Immediately - Messages will be forwarded to the destination HL7 application (s) as soon as they are received.
  - **'From'** and **'To'** Schedule Window - Messages will be forwarded to the destination HL7 application (s) when the current time is within the specified [**From**, **To**] Schedule Window.
  - Fixed 24-hour clock interval - Messages will be forwarded at the specified hour. For example, if the schedule is set to 9:00 P.M., then the received messages will not be forwarded to the destination HL7 application (s) until the local time is 9:00 P.M. If there are any messages received between 9:00 P.M. and 9:59 P.M., they will be forwarded immediately, and messages received after 9:59 P.M. will be forwarded the next day at 9:00 P.M.

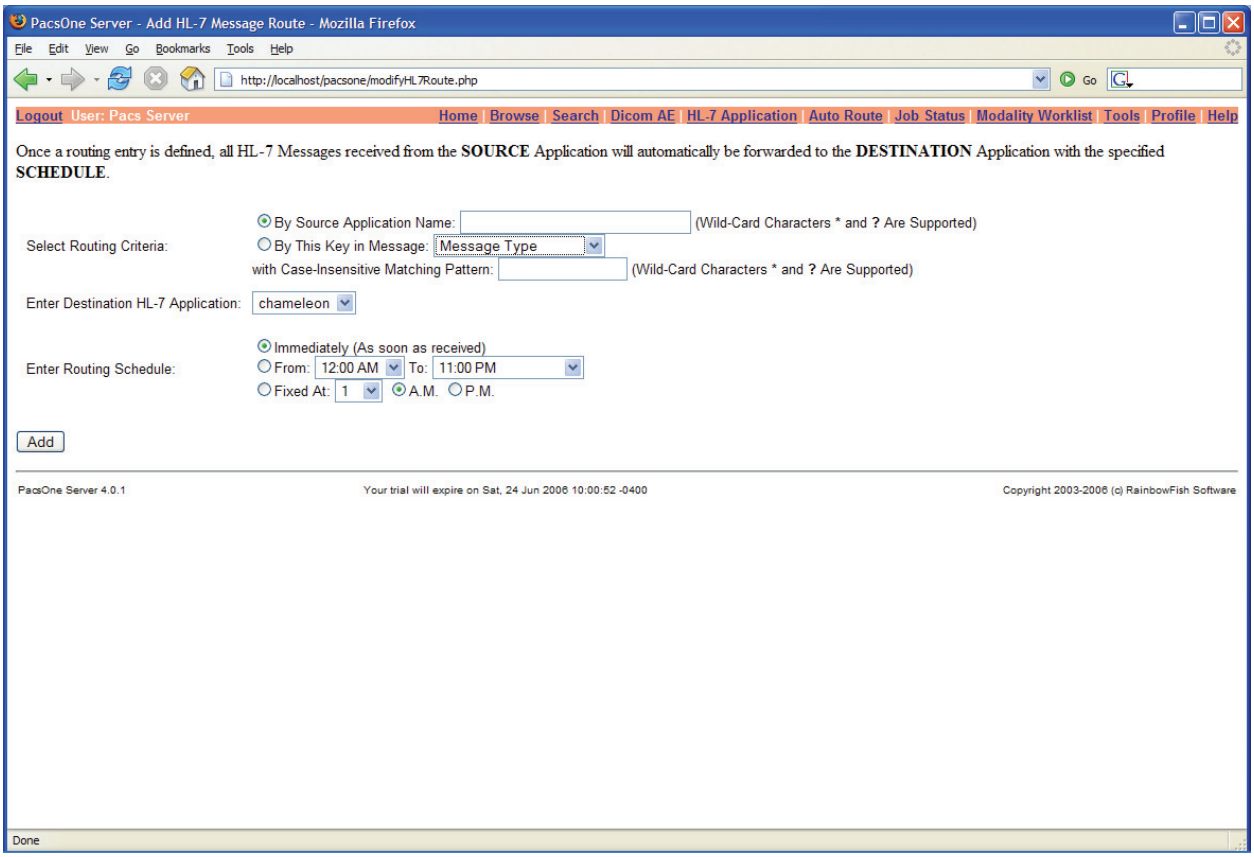
PacsOne Server - Add HL-7 Message Route - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://localhost/pacsone/modifyHL7Route.php
Go
Logout User: Pacs Server
Home | Browse | Search | Dicom AE | HL-7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
Once a routing entry is defined, all HL-7 Messages received from the SOURCE Application will automatically be forwarded to the DESTINATION Application with the specified SCHEDULE.
Select Routing Criteria:
By Source Application Name:
(Wild-Card Characters * and ? Are Supported)
By This Key in Message: Message Type
with Case-Insensitive Matching Pattern:
(Wild-Card Characters * and ? Are Supported)
Enter Destination HL-7 Application: chameleon
Enter Routing Schedule:
Immediately (As soon as received)
From: 12:00 AM To: 11:00 PM
Fixed At: 1 A.M. P.M.
Add
PacsOne Server 4.0.1
Your trial will expire on Sat, 24 Jun 2006 10:00:52 -0400
Copyright 2003-2006 (c) RainbowFish Software
Done

Figure 52 Automatic HL7 Message Routing (optional)

17 Printing Images

When navigating through the patients, studies, series and images stored in the PacsOne database, if the current user has the '**`Print`**' privilege enabled, a '**`Print`**' button will be displayed to allow current user to print the selected patients, studies or series to a remote destination Dicom Printer/Print SCP:

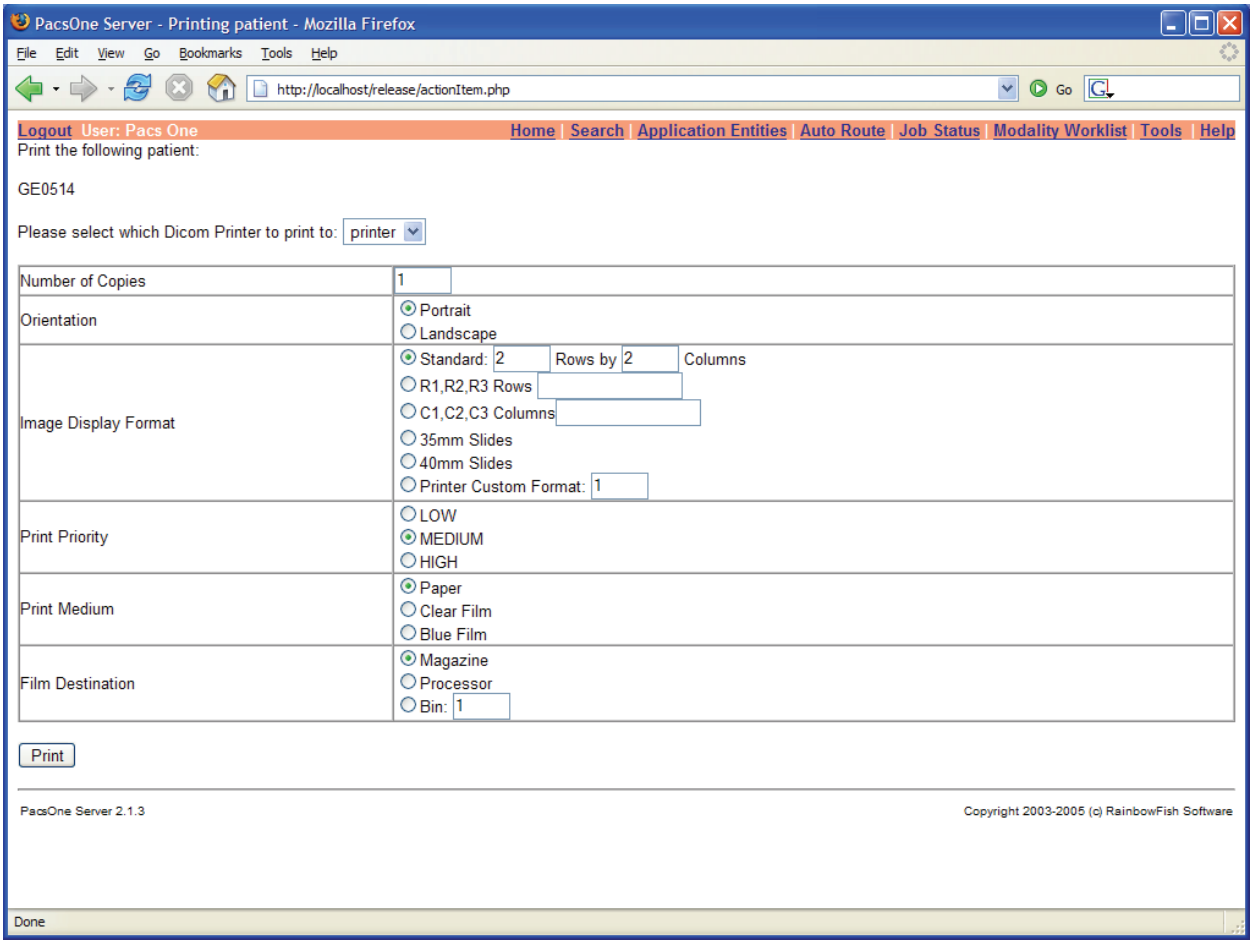

Figure 53 Printing to Remote Dicom Printer

From the above **`Print`** menu page, users can select the destination Dicom printer and choose the following printing parameters:

- Number of copies
- Film orientation
- Image display format (can be printer specific)
- Print priority (if supported by remote printer)
- Print medium
- Film destination
- Convert color images to grayscale (if applicable) – If the images being printed are a mixture of both color and grayscale images, users can choose whether or not to convert all color images to grayscale before sending them to the Dicom printer which may not support printing color images

18 Job Status Page

The current status of all database jobs submitted by the current user are displayed by clicking on the '`Job Status`' link of the `Main Menu` bar in the `Job Status` page, with the '`Completed`' jobs displayed first followed by '`Failed`' database jobs.

If the current logged-in user has the '**`Modify`**' privilege, then there will be a '**`Retry`**' button as well as a '**`Delete`**' button displayed in this page if there is any failed job. User can select the job (s) to delete or retry by

clicking on the checkbox in front of the job ID column and pressing either the '**Delete**' button or the '**Retry**' button.

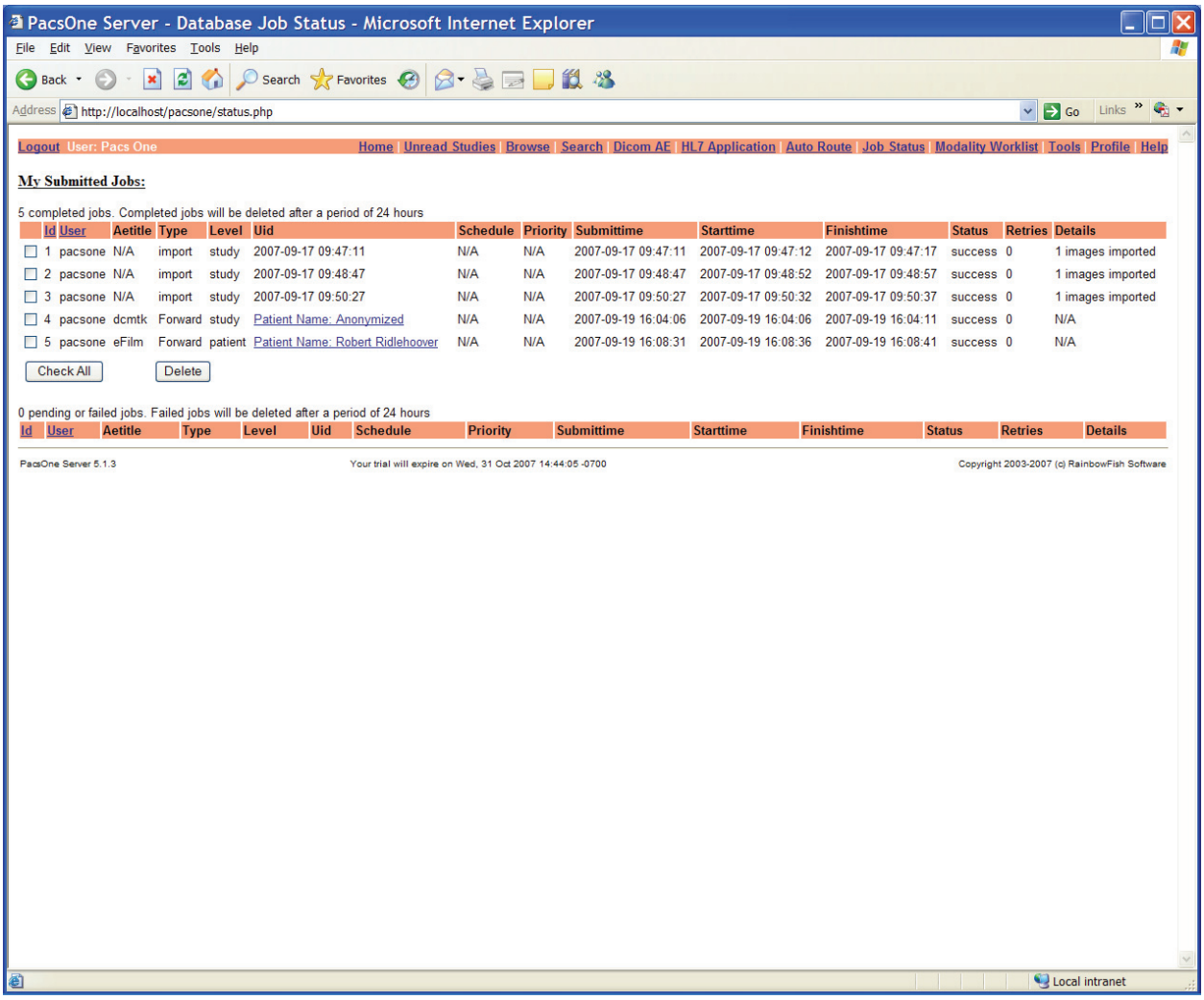
PacsOne Server - Database Job Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost/pacsone/status.php
Go Links
Logout User: Pacs One
Home | Unread Studies | Browse | Search | Dicom AE | HL7 Application | Auto Route | Job Status | Modality Worklist | Tools | Profile | Help
My Submitted Jobs:
5 completed jobs. Completed jobs will be deleted after a period of 24 hours
Id User Aetitle Type Level Uid Schedule Priority Submittime Starttime Finishtime Status Retries Details
1 pacsone N/A import study 2007-09-17 09:47:11 N/A N/A 2007-09-17 09:47:11 2007-09-17 09:47:12 2007-09-17 09:47:17 success 0 1 images imported
2 pacsone N/A import study 2007-09-17 09:48:47 N/A N/A 2007-09-17 09:48:47 2007-09-17 09:48:52 2007-09-17 09:48:57 success 0 1 images imported
3 pacsone N/A import study 2007-09-17 09:50:27 N/A N/A 2007-09-17 09:50:27 2007-09-17 09:50:32 2007-09-17 09:50:37 success 0 1 images imported
4 pacsone dcmtk Forward study Patient Name: Anonymized N/A N/A 2007-09-19 16:04:06 2007-09-19 16:04:06 2007-09-19 16:04:11 success 0 N/A
5 pacsone eFilm Forward patient Patient Name: Robert Ridlehoover N/A N/A 2007-09-19 16:08:31 2007-09-19 16:08:36 2007-09-19 16:08:41 success 0 N/A
Check All
Delete
0 pending or failed jobs. Failed jobs will be deleted after a period of 24 hours
Id User Aetitle Type Level Uid Schedule Priority Submittime Starttime Finishtime Status Retries Details
PacsOne Server 5.1.3
Your trial will expire on Wed, 31 Oct 2007 14:44:05 -0700
Copyright 2003-2007 (c) RainbowFish Software
Local intranet

Figure 54 Job Status Page

- `Id` – Job ID which is generated automatically by the MySQL database
- `User` – The username which created the database job
- `AeTitle` – Destination AE title
- `Type` – Job type, e.g., 'Forward', 'Print', etc.
- `Level` – Hierarchy level, e.g., 'Patient', 'Study', 'Series', etc.
- `UID` – Unique ID in the hierarchy level, e.g., patient ID, study UID, series UID, etc.
- `SubmitTime` – Timestamp on when the database job is submitted
- `StartTime` – Timestamp on when the database job starts processing
- `FinishTime` – Timestamp on when the database job finishes processing
- `Status` – Success or Failure
- `Details` – Any detailed errors if the database job has failed